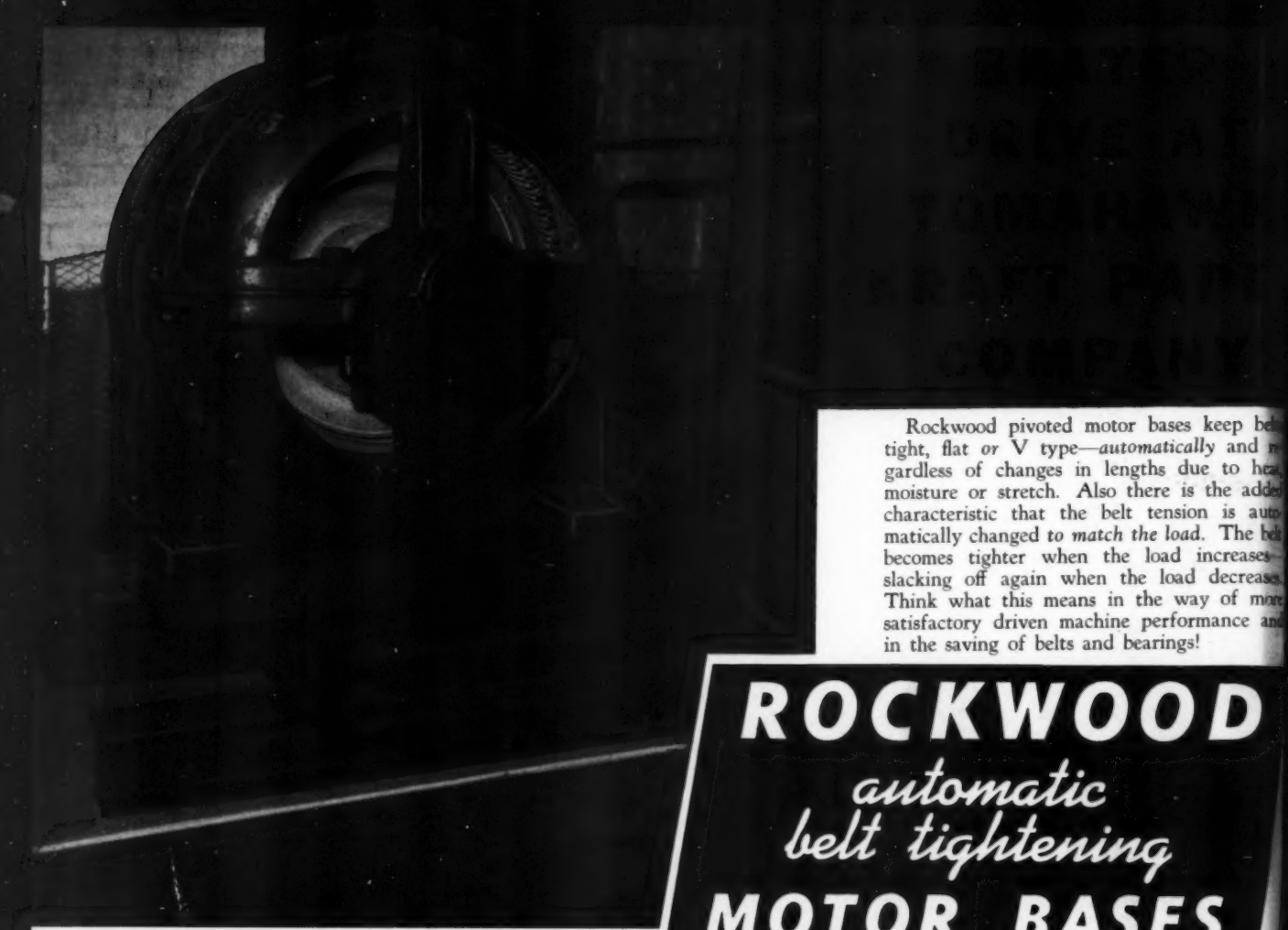
THE PAPER INDUSTRY and PAPER WORLD

AN EDUCATIONAL NEWS MAGAZINE — JULY, 1942

"United We Stand"

Contributed by the DOWNINGTOWN MANUFACTURING COMPANY, DOWNINGTOWN, PA.



Rockwood pivoted motor bases keep bel tight, flat *or* V type—*automatically* and r gardless of changes in lengths due to hea moisture or stretch. Also there is the adde characteristic that the belt tension is aut matically changed *to match the load.* The bel becomes tighter when the load increases slacking off again when the load decreases. Think what this means in the way of mor satisfactory driven machine performance an in the saving of belts and bearings!

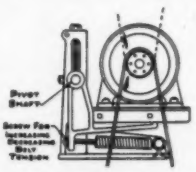
ROCKWOOD *automatic belt tightening* MOTOR BASES

Improves paper mill machine performance—increases output—saves belts

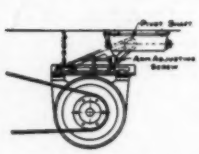
THIS is a typical short center Rockwood pivoted Drive to 75 h.p. beater—at Tomahawk Kraft Paper Company mill.

The mill reports "we prefer this drive because it makes possible the use of endless belts and adds greatly to their life. The tension is off the belt when the machine is not in use, idling or operating with a light load, but when the load is increased it causes the motor to 'PULL INTO THE BELT' and delivers the power without the use of excessive belt dressing."

FLOOR BASE



MACHINE MOUNTING



LINESHAFT BASE

all automatic belt tightening

Keeping the belt at right tightness automatically, and regardless of load changes, gives industry something no other drive ever did before. Driven machine output is increased, so more work is done per hour, per day. The drives operate with practically no maintenance so their performance is continuous and chances of break downs or lost time are eliminated.

WHY NOT CHANGE YOUR MACHINES TO THESE BETTER DRIVES NOW? The changes are easy to make and the cost will be paid through savings in less than a year. *Order today while you still can get delivery.* And don't forget these bases are as much needed by—and as beneficial to—V-belt drives as to flat belts.

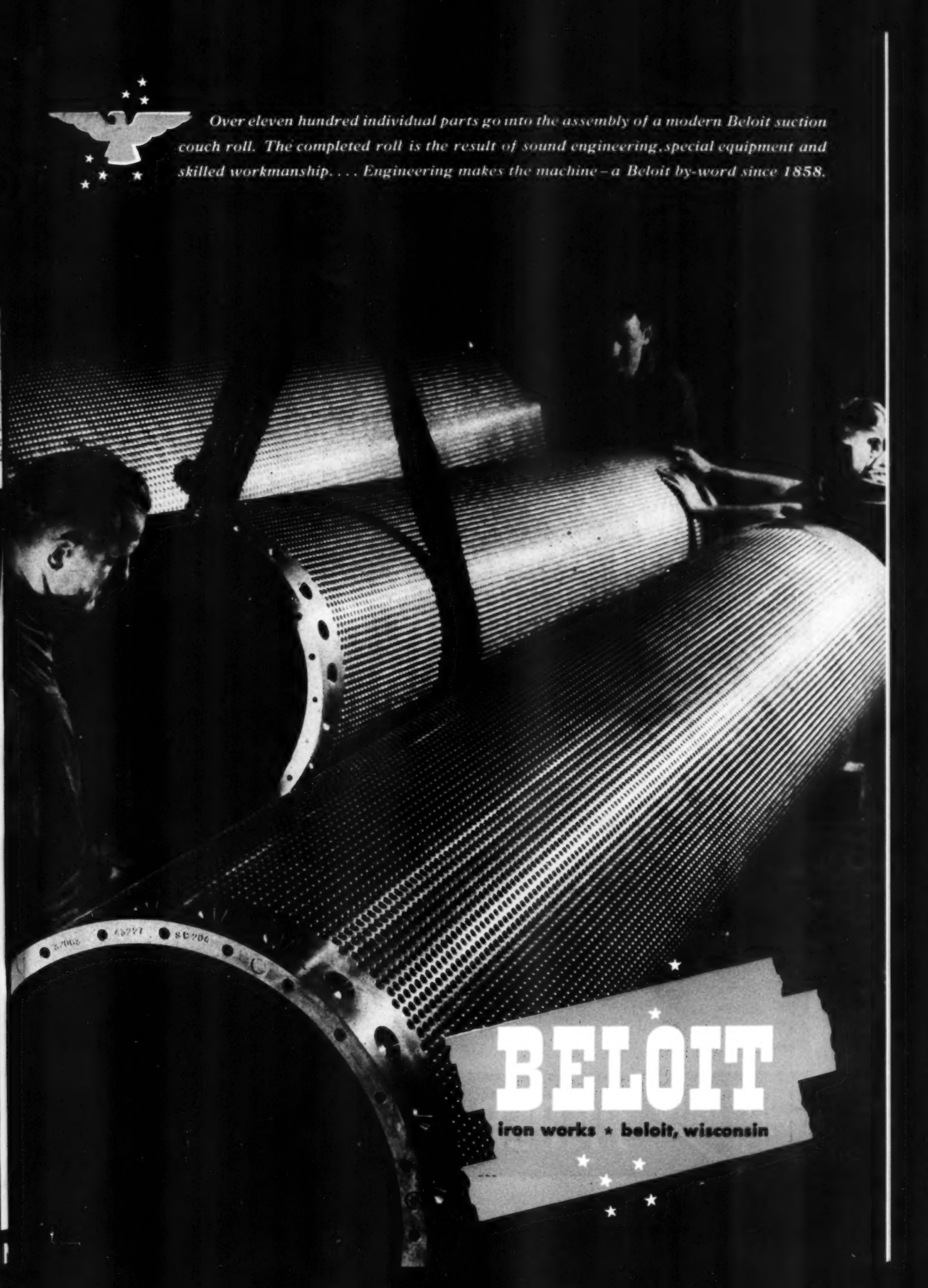
Rockwood Automatic Belt Tightening Motor Bases come in three types as illustrated—for floor, ceiling or machine mounting. We have stock sizes in all three types up to 50 or 60 h.p.—and semi-stock sizes up to 250 h.p. Bases for larger h.p. made special and without limit as to size.

WRITE FOR LATEST COMPLETE INFORMATION ON THE DRIVE YOU ARE INTERESTED IN.

POWER TRANSMISSION SPECIALISTS SINCE 1884—ROCKWOOD PAPER PULLEYS—V-BELT DRIVES—PIVOTED MOTOR BASES

ROCKWOOD MANUFACTURING CO., INDIANAPOLIS, I

ROCKWOOD MANUFACTU


Over eleven hundred individual parts go into the assembly of a modern Beloit suction couch roll. The completed roll is the result of sound engineering, special equipment and skilled workmanship. . . . Engineering makes the machine – a Beloit by-word since 1858.
BELOIT
iron works ★ beloit, wisconsin

The "DURATION" means nothing to these pumps

The *duration*—the short span of a few years—has little effect upon the daily efficiency of Buffalo Full Ball-Bearing Pumps. They are specially designed and built for long years of paper mill service, moving heavy paper stock swiftly—without clogging—without damage from those sudden and frequent changes in stock consistency. *And all this with top efficiency!* Long after the "duration" has passed, Buffalo Paper Stock Pumps will be carrying on.

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Branch Engineering Offices in Principal Cities
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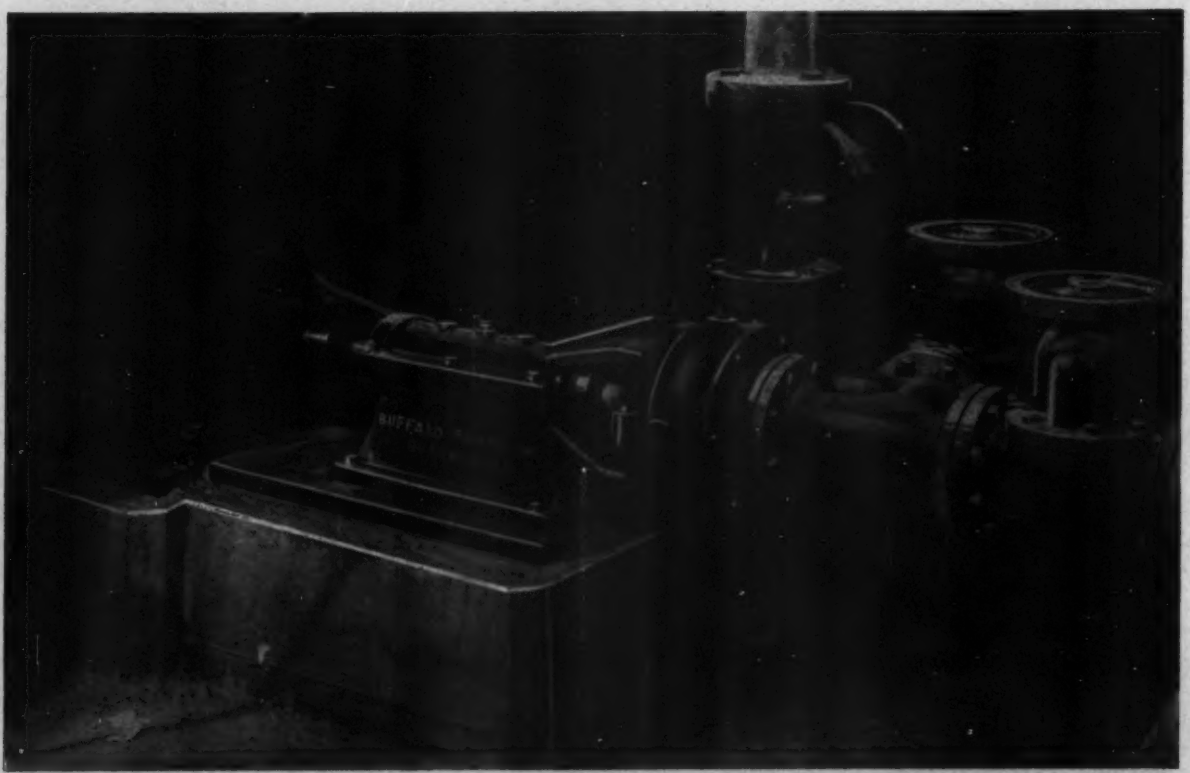
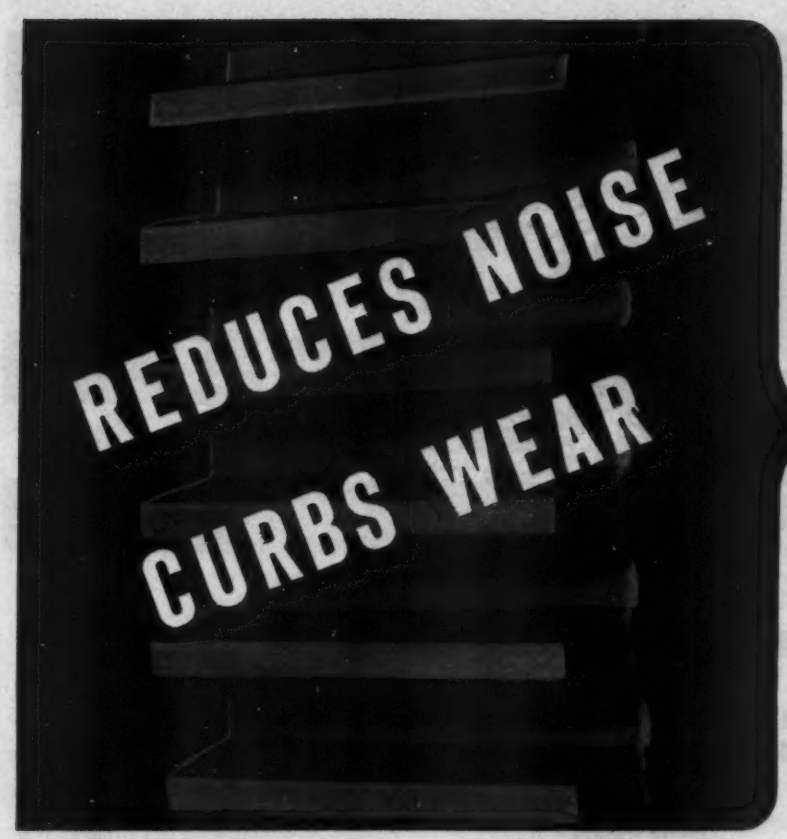


"Buffalo" PAPER STOCK PUMPS



THEY PREFER TEXACO

★ More Diesel horsepower on streamlined trains in the U. S. is lubricated with Texaco than with all other brands combined.

★ More locomotives and cars in the U. S. are lubricated with Texaco than with any other brand.

★ More revenue airline miles in the U. S. are flown with Texaco than with any other brand.

★ More buses, more bus lines and more bus-miles are lubricated with Texaco than with any other brand.

★ More stationary Diesel horsepower in the U. S. is lubricated with Texaco than with any other brand.

Tune in the TEXACO STAR THEATRE every Sunday night—CBS

SPEEDED up to produce the greatest pulp and paper tonnages in history, hard-to-replace open gears must have lubricants that stay put, prolonging their useful life.

Paper mill operators everywhere find just such a lubricant in *Texaco Crater.*

Texaco Crater clings to gear teeth, cushioning load shocks, reducing wear, deadening noise. Does not channel, ball up, or throw-off.

The outstanding performance that has made Texaco preferred in the fields listed in the panel has made it preferred by prominent pulp and paper mills everywhere.

These Texaco users enjoy many benefits that can also be yours. A Texaco Lubrication Engineer will gladly cooperate . . . just phone the nearest of more than 2300 Texaco distribution points in the 48 States, or write:

The Texas Company, 135 East 42nd Street, New York, N. Y.

Care for your Car ..for your Country

TEXACO Lubricants and Fuels
FOR THE PAPER INDUSTRY

HELP WIN THE WAR BY RETURNING EMPTY DRUMS PROMPTLY

A PIONEER THEN—

A LEADER TODAY

IN 1892, in a Virginia valley noted for its vast deposits of pure salt, Mathieson began the construction of the first of three great factories. Over a period of half a century, they were to supply America's growing industries with vital chemicals. Today—fifty years later—the Mathieson plants at Saltville, Va., Niagara Falls, N.Y. and Lake Charles, La., are working twenty-four hours a day to supply the nation's *war* industries with the "raw materials of victory."

This is the over-all picture of a typically American enterprise—The Mathieson Alkali Works. It is a story of growth and progress in chemical research... in developing new products... and in devising more efficient methods of handling and transporting chemicals.

Among Mathieson's early achievements was the development of the Castner electrolytic cell for producing chlorine and extremely pure caustic soda. The first to make bleaching powder in the United States, Mathieson pioneered the manufacture of synthetic ammonia, liquid chlorine and such outstanding chlorine products as calcium hypochlorite and sodium chlorite. Chlorine, today in great demand for war production, is also safeguarding the health of our fighting men on all fronts as calcium hypochlorite, the *mobile* chlorine carrier.

These are but a few milestones in the fifty years of Mathieson Chemicals. They are tangible evidence of the drive and initiative which have marked Mathieson's rise from modest beginnings to a place of leadership in the field of industrial chemicals.

CELEBRATING 50 YEARS OF SERVICE TO AMERICAN INDUSTRY AND PUBLIC HEALTH

MATHIESON CHEMICALS

The Mathieson Alkali Works, (Inc.) 60 East 42nd Street, New York, N.Y.

THE PAPER INDUSTRY and PAPER WORLD

VOLUME 24 — JULY, 1942 — NUMBER 4

Published monthly by
FRITZ PUBLICATIONS, INC.
59 E. Van Buren St., Chicago, Ill.

Member:
Audit Bureau of Circulations
Associated Business Papers, Inc.

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Entered as second class matter June 29, 1938, at the post office at Chicago, Ill., under the Act of March 3, 1879. Subscriptions in the United States, U. S. Possessions, Canada, Cuba and Mexico, $2.00 for one year or $3.00 for two years. All other countries $3.00 for one year, or $5.00 for two years.

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THE PAPER INDUSTRY and PAPER WORLD is indexed regularly in *The Industrial Arts Index*. An index to each volume is issued annually by the publisher as Section Two of the April number.

—FEATURES—

Keep Your Monel on the Firing Line.....R. T. Barnes, Jr. 365
How to Keep Belt Drives Running.....J. R. Hopkins 368
Turbine Gear Sets for Paper Machine Drive.....A. J. Churchill 370
Production Planning in a Rag Mill.....H. M. Grasselt 371
Core Waste Nomograph.....D. S. Davis 373
Superintendents Convene in Wartime Meeting..... 376
Maintenance and Conservation Forum..... 414
Convention Papers . . . Abridged..... 430

—NEWS—

"Conservation"..... 340
Trade Winds..... 341
Associations..... 376
Allied..... 402
Safety..... 406
Names in the News..... 408
Personals..... 408
Necrology..... 412

—DEPARTMENTS—

Theme Page..... 340
Editorials..... 357
Current Thought..... 358
Paper Sketches..... 374
Coming Events..... 398
Safety Contest Scores..... 406
New Equipment & Supplies.. 444
Technical Developments.... 448
Papermaking Patents..... 450
New Publications & Reports.. 452
Current Market Quotations... 454
Index to Advertisers..... 457

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An Announcement by

BUELL ENGINEERING COMPANY, Inc.

* * *

Buell Engineering Company, Inc. announces it is discontinuing its non-exclusive sales agency agreement with B. F. Sturtevant Company, as of August 1, 1942.

This agreement, entered into in March, 1939, authorized the B. F. Sturtevant Company to sell in their name Buell (van Tongeren) dust collectors in the continental United States and Alaska on a commission basis. Buell however has been entirely responsible for the design, construction and operation of all Buell (van Tongeren) dust collectors sold by Sturtevant.

After August 1st, 1942 all inquiries for Buell equipment and services should be directed to Buell Engineering Company, Inc., 70 Pine Street, New York City, or to the company's own established sales representatives located in principal cities as follows:

Atlanta, Ga.—MOORE-BROACH ENGINEERING CO.....412 Title Building
Buffalo, N. Y.—HENRY F. SPROULL.....319 Jackson Building
Chicago, Ill.—D. H. SKEEN & COMPANY.....1 La Salle Street
Dallas, Texas—A. M. LOCKETT & CO., LTD.....305 Magnolia Building
Detroit, Michigan—THE POE COMPANY.....2842 West Grand Blvd.
Houston, Texas—A. M. LOCKETT & CO., LTD.....1014 Electric Building
Milwaukee, Wisc.—THE DORNER COMPANY....2766 North Downer Avenue
New Orleans, La.—A. M. LOCKETT & CO., LTD.....308 Whitney Building
Philadelphia, Pa.—WM. P. MACKENZIE.....1211 Commercial Trust Building
Pittsburgh, Pa.—D. D. PENDLETON.....418 Bessemer Building
St. Louis, Mo.—B & B COMBUSTION EQUIPMENT CO..4030 Chouteau Avenue

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DUST RECOVERY SYSTEMS

BUELL ENGINEERING COMPANY, Inc. • *70 Pine Street, New York*

A BAKER MATERIAL HANDLING ENGINEER can help you to . . .

1. Increase Plant Capacity
2. Conserve Man Power
3. Speed Your Deliveries
4. Cut Production Costs
5. Improve Plant Safety
6. Plan Future Material Handling Requirements

All Baker representatives are qualified material handling engineers. They have been in hundreds of plants, and know intimately the problems confronting you wherever materials or finished products are to be moved—in the plant, in the warehouse, on the shipping or receiving platforms, and on shipping piers—they can evaluate your complete handling set-up, and recommend the type of equipment best suited to your plant. If you are after any of the objectives outlined above, it will be well worth your while to seek advice of the Baker representative nearest you.

BAKER INDUSTRIAL TRUCK DIVISION
of The Baker Raulang Company
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Typical Case of Baker Material Handling Engineering Service

Recently a manufacturer, contemplating plant expansion to meet increased production schedules, called in a Baker Engineer to discuss truck requirements. After a complete survey, the Baker Engineer submitted a plan which achieved the production objectives without plant expansion, by a readjustment of material handling facilities and the addition of new equipment, thus avoiding the expense and inconvenience of new construction.

Baker INDUSTRIAL TRUCKS

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COTTRELL PROCESS

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ELECTRICAL PRECIPITATION

universally recognized as a
standard method of removing

DUST, FLY ASH, FUME, MIST & FOG

***from* GASES**

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30 years of research development and operating experience by the affiliated Cottrell Companies throughout the world is incorporated in the

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HOW TO MAKE YOUR LEATHER BELTS LAST LONGER!

1. Be sure the belt is engineered to the job. An under-belted drive wears out the belt before its time. Be sure to allow for proper safety factor.

2. Check the laps. Should they begin to give way, repair them with waterproof belt cement. Don't try to fix them by rivets or lacing.

3. Check the tension. Too tight a belt is hard on flexing fibers, hard on bearings. Too loose a belt won't pull the load efficiently.

4. Don't let shifters or step-cone pulleys rub belt edges, which would elongate one side.

5. Check pulley and shaft alignment. Don't run a belt that starts crooked. If it jumps off, find the reason.

6. Check the running direction. Single belts should have grain side next to pulley, with point of lap running away from pulley, rather than into it. Double belts should have inner lap pointing away from pulley, and outer lap pointing away from windage which is created by travel.

7. Nourish the belts by proper preservative. The tanner has compensated for nature's oils in the fibrous structure, but belts dry out eventually. Add a penetrating preservative that does more than merely dress the surface.

8. Watch your belt storage. Before storing away, clean your belts, cement loose edges or laps, and apply a preservative to both sides. Store them in a covered space, protected against dust and change of temperature. When putting belts into use again, give them another application of preservative.

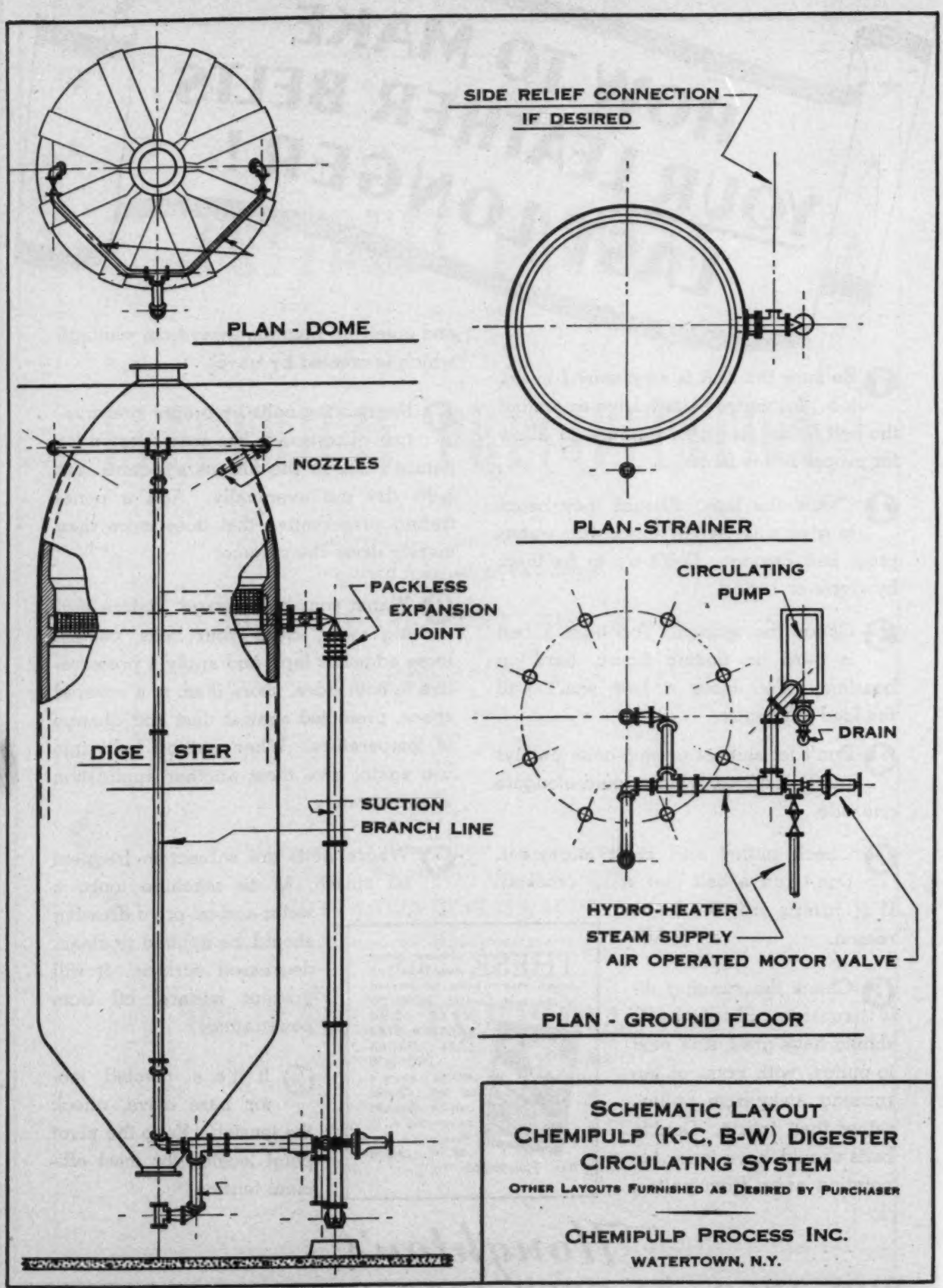
9. Where belts are subject to frequent oil splash, as on machine tools, a water-and-oil-proof dressing should be applied to clean, degreased surface. It will prevent mineral oil from penetrating.

10. If it's a pivoted motor base drive, check the tension. Keep the pivot point located for most efficient tension.

THESE common-sense pointers on proper care of belts are covered in the new booklet "HOW TO MAKE YOUR LEATHER BELTS LAST LONGER . . . PRODUCE MORE" shown at left. Copies can be obtained by writing E. F. Houghton & Co., 303 W. Lehigh Ave., Philadelphia, Pa.

Houghton's

VIM TRED and OKAY TRED LEATHER BELTING



SCHEMATIC LAYOUT
CHEMIPULP (K-C, B-W) DIGESTER
CIRCULATING SYSTEM

OTHER LAYOUTS FURNISHED AS DESIRED BY PURCHASER

CHEMIPULP PROCESS INC.
WATERTOWN, N.Y.

Standard Chemipulp (K-C, B-W)

Digester Circulating System

The result of over 15 years continuous research and development

. . . *Increase Digester Yield 20 to 35%*

. . . *Improve Pulp Quality and Uniformity*

. . . *Reduce Production Costs*

NOTE: Simplicity of layout, free floor space around pump and under digester, streamlined equalizing strainer flush with the lining, branch line to top dome, separate drain to facilitate repacking pump and renewing gaskets and other exclusive features.

PATENTED FEATURES SOLD EXCLUSIVELY WITH THE CHEMIPULP CIRCULATING SYSTEM:

THE HYDRO-HEATER - -

A device to mix steam for cooking with acid heated external to the digester, thus preventing localized overheating and subsequent non-uniformity of pulp quality and high screenings.

FULL AUTOMATIC CONTROL - -

To remove the human element, obtain identical operation from cook to cook and maximum digester yield with consistently clean blows.

STREAMLINED EQUALIZED STRAINERS - -

Built to produce uniform acid suction over the entire cross sectional area of the digester and to reduce stock hang-up during blowing.

THE CHEMIPULP (K-C, B-W) CHIP DISTRIBUTOR - -

With its adjustable rotating gate which serves as an intermediate hopper between the chip bin and the digester, and thus feeds chips uniformly to the adjustable paddles projecting into the digester. With this mechanism, it is possible to lay the chips flat or in a slightly concave surface over the cross sectional area of the digester, thus preventing channeling of the acid during circulation.

We furnish complete engineering service and start-up supervision so necessary in the training of the operating crew to obtain the maximum return on the investment. Your inquiries will be greatly appreciated.

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MAINTENANCE AND CONSERVATION

● In these busy times, serious consideration is being given to the most efficient methods for getting the most out of equipment, supplies, and raw materials. So important is this subject to the pulp and paper industry that the entire program of the recent annual convention of The American Pulp and Paper Mill Superintendents Association was devoted to Maintenance and Conservation.

● For some weeks a series of bulletins on Conservation practice has been presented by the American Paper and Pulp Association. Co-operating in the compilation of these bulletins were the Technical Association of the Pulp and Paper Industry and The American Pulp and Paper Mill Superintendents Association. A recent monograph of TAPPI is entitled "Saving Fourdrinier Wire—A Part of the War Conservation Program."

● Similar publications also have been released by a number of firms supplying equipment to pulp and paper mills. Some of these publications are general; others are slanted specifically toward the pulp and paper industry. Several cases in point are:

"Maintenance Hints" (Vols. I and II), Westinghouse Electric & Manufacturing Company

"Tips on Maintaining Electric Equipment in the Paper Industry," General Electric Company

"Maintenance of Pumps," prepared by John H. Hall, Warren Steam Pump Company

"101 Suggestions for Good Operating Practice," Johns-Manville

● This magazine has endeavored to do its part in the Maintenance-Conservation program. The two past issues of "The Paper Industry and Paper World" featured the following articles:

"Longer Life for Industrial Rubber Products" (May, 1942).

"Oxyacetylene Welding and Cutting in Paper Mill Maintenance," (June, 1942).

"Selection-Installation-Maintenance of Electric Motors," (June, 1942).

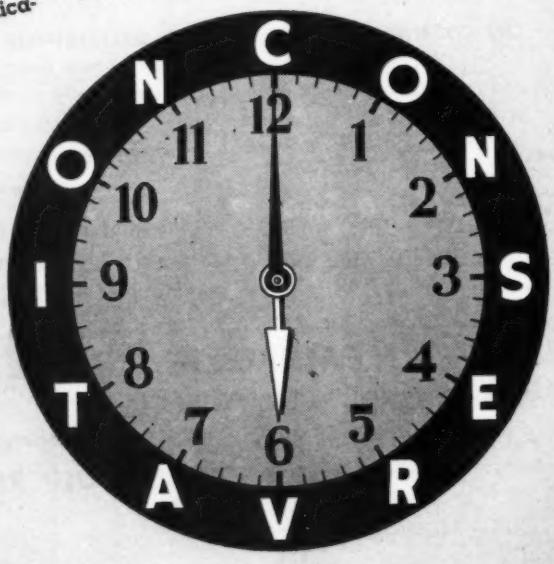
This issue features two more such articles:

"Keep Your Monel on the Firing Line"

"How to Keep Belt Drives Running"

● CONSERVATION is more than a necessity—it is a wartime obligation, and there is not an operating executive, engineer, chemist, or any paper mill employee who does not have a job to do in this conservation program.

Conserve your time. Read and apply valuable published information. By applying some of these suggestions to your problems, you will be helping the paper industry to do its part in winning the War.



TRADE WINDS

SOME EASTERN MILLS CLOSING

▶▶▶ During the past few weeks, the International Paper Company has informed employees of the closing of two of its mills in New England.

Fort Edward, New York

On June 6, a statement was made by C. E. Youngchild, general manager of the plant at Fort Edward, New York, that the company planned to close the plant about August 1. It was proposed that stock on hand would be used until the supply became exhausted, which should keep the mill operating from two to four days a week. Employees were advised to make arrangements for employment elsewhere.

The Fort Edward mill is one of several in the book and bond division of the International Paper Company. It has been reported that orders have been falling off since the War. Previously, the plant shipped large quantities of paper to South American and other foreign ports, but transportation difficulties have curtailed these shipments.

Orono, Maine

The International company's plant at Orono, Maine, closed on June 20 for an indefinite period of time. It is understood that both the pulp and paper mills will be closed for at least some time. This plant manufactures wallpaper.

It is expected that the machine shop, which employs five men on defense work, will remain in operation, but the remaining 200 employees will find it necessary to look elsewhere for work.

Lawrence W. Murray, superintendent of the paper mill, and Wesley Stevens, superintendent of the pulp mill, who were transferred to Orono from the Livermore Falls (Maine) plant, are returning to that mill. Harry Newell, chemist, is leaving for the company's mill at Palmer, New York. Donald C. Lincoln, mill manager, has announced no definite plans.

Orono Pulp and Paper Company, Basin Mills, Maine

Another mill to close is the Orono Pulp and Paper Company, Basin Mills, Maine, which discontinued operation on June 13. A large number of employees were thrown out of work.

◆

KIMBERLY-CLARK SALVAGING 95% PURE GUM RUBBER

The Kimberly-Clark Corporation is contributing heavily to the salvage rubber campaign by reclaiming tons of 95 per cent pure gum rubber which formerly was given up as waste. One of its Neenah, Wisconsin, mills formerly manufactured a creped pulp product impregnated with liquid latex for a leather substitute for shoes, brief cases, and many other articles. Small quantities of liquid latex adhered to the walls of tanks and open drains, and a good deal of the leakage lodged in the tail races and canal of the mill.

Formerly nothing was done about attempting to salvage this waste due to the cost, but cost is not the item these days, and the Kimberly-Clark Corporation is conducting an extensive and dangerous operation to get this valuable product to the Government.

◆

CAN. MACHINE SHOP BOARD PROGRESSES

In addition to the utilization of surplus capacity of mill machine shops, the Wartime Machine Shop Board of the Canadian pulp and paper industry has undertaken the upgrading or thinning out of mill staffs to make men available for war industries, and the training of new men.

At the outbreak of the War, the industry was just emerging from a long troublesome period, and was shorter of skilled workers than usual. Some mills were able to take advantage of the training facilities of nearby trade schools, however, where no trade schools were available, different methods of imparting the necessary instruction had to be devised. The plan used by most organizations limits the basic training to 12 months. Home study courses provide the theoretical training, and practical shop work is done concurrently. Where it is not feasible to have men working on practical problems in line with their home study, the men are required to attend practical courses at night.

The Wartime Machine Shop Board was set up by the industry with a full-time co-ordinator and staff to arrange the necessary contracts between units in the industry and generally supervise the plan. At first the Board worked with the Director General of Munitions, but since the government appointed a special agency to handle sub-contracts, they have been co-ordinating their activities with the requirements of this new department.

◆

ENGLISH PAPERS ARE AFFECTED BY NEWSPRINT CUT

The newspaper circulation manager in England is now confronted with the problem of selling only a certain number of papers at a time of unprecedented demand. Newsprint supplies have been sharply cut since the advent of war, and, as recent as mid-March, came a further 10 per cent reduction to save additional shipping space on the transatlantic freighter routes.

Before the War, the average London-published national daily contained sixteen to twenty-four pages. It now has a four-page issue, while the Sunday papers consist of six- to eight-page editions. The *Times, Daily Telegraph, Manchester Guardian, Scotsman,* and *Glasgow Herald* are allowed to publish larger issues. These higher priced papers carry a large amount of classified advertising, regarded, even in wartime, as a public service.

Newsprint tonnage available is fixed by the Government. The newspapers, themselves, having formed a co-operative concern called Newspaper Supply Company, make the supply go around. Scarcely any papers allow agents to return unsold copies, thus holding purchases to a minimum. Readers wishing regular delivery may be forced to wait three weeks or a month until some subscriber cancels before their subscriptions are taken.

Both the United States and Canadian Governments are watching to see how England handles the newsprint situation.

◆

NEWSPRINT IMPORT CASE IS SETTLED

In a case involving the dutiability of newsprint paper imported at Jacksonville, Florida, from Newfoundland, an agreement has been reached between the Government and the importer after the case was before the United States Customs Court at Jacksonville and New York.

The paper was found to be in excess of 4 points in thickness when examined upon importation, and was classified for duty. Investigation, however, showed that the inner portion of the rolls was within the 4 point limitation, and that presumably the portion examined had increased in bulk because of unusual humidity at the time of importation. Under a stipulation that the shipment as a whole did not consist of paper over 4 points in thickness, the paper doubtless will be admitted free of duty, according to the Import Committee of the American Paper Industry.

◆

▶▶▶ THE BROWN CORPORATION, of La Tuque, Quebec, subsidiary of Brown Company, Berlin, New Hampshire, lately has been producing a specially refined grade of bleached pulp that is being utilized for explosives.

◆

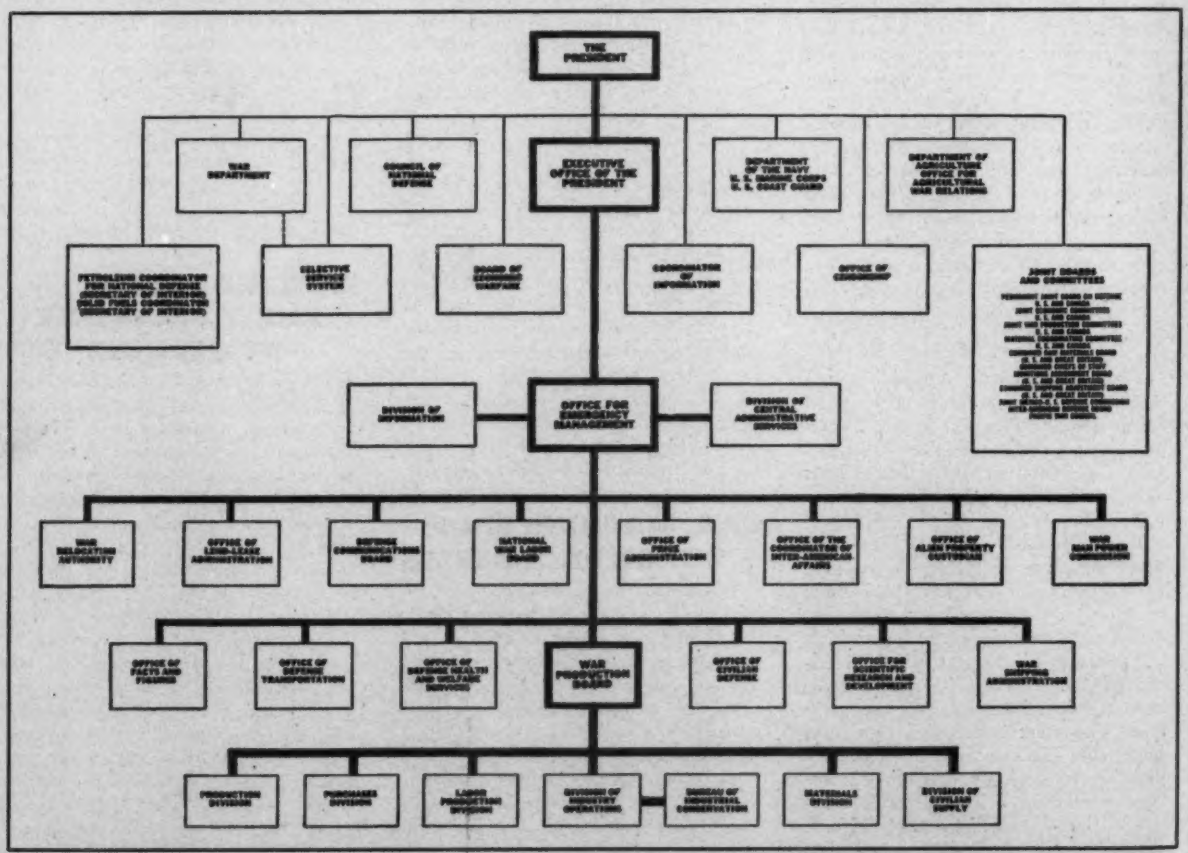
IMPORT COMM. LOSES RULING ON KRAFT BAG PAPER

The long pending question of the classification of kraft bag paper has been decided adversely to the position of the Import Committee, which held that this material should not be included in the reduced rate granted to kraft wrapping paper. Although domestic producers could readily identify bag paper as such, as distinct from what is known to the American industry as wrapping paper, the Customs officials have decided that the intent of the Reciprocal Trade Agreement with Finland was to admit such paper as wrapping paper at the reduced rate of 20 per cent, instead of the original rate of 30 per cent provided in the Tariff Act. The Customs officials originally agreed with the position of the Import Committee, but on reconsideration changed their attitude.

The decision will also include kraft envelope paper under the reduced rate for wrapping paper. Under the phraseology of the Reciprocal Trade Agreement Act, the domestic industry is denied any recourse to the Customs courts for review of the action of the Customs officials.

◆

▶▶▶ EARLY IN JUNE, forest fires in the Price Brothers forestry concessions near the Shipshaw River and Lake Taillon in the Chicoutimi district of Quebec caused much damage to the forests and destroyed provision camps. Other small fires in the northern portion of the Province were quickly brought under control.



The intricate pattern of the War Agencies and their inter-relations are graphically shown by this chart issued by the OEM.

PAPER · · · America's 6th Industry

PAPER BAGS GO TO WAR

(NEWS ITEM: *Delicate instruments for U. S. fighting planes are protected by paper bags as they move down the assembly line in a midwest plant*)

Ordinary paper bags are performing extraordinary services in America's Victory Program.

Magnetos for U.S. fighting planes are covered by paper bags for protection against dust during the process of manufacture. It is attention to details like this that makes America's "warbirds" the finest in the world.

Paper bags are taking the place of metal containers for the packaging of many civilian necessities, saving metal urgently needed in the war effort. Substantial quantities of kraft paper are now being used for the manufacture of heavy-duty bags to replace the burlap formerly available.

Supplying all the paper bags needed by America at war is just one of many responsibilities of the Paper Industry. It calls for top production from every paper machine . . . greater speeds and better qualities than ever before possible.

The world's largest manufacturer of paper bags is meeting the ever-increasing demand for paper bags in the war effort with high-speed Puseyjones Machines, recently modernized to step up production more than 25 per cent.

Among the outstanding Puseyjones developments that are now proving their effectiveness in this great mill are high-speed Slice improvements to insure proper formation, rubber-covered Suction Press Rolls, improved Steam Joints and additional Dryers.

Keeping paper production at the point of highest efficiency is not only essential to Victory, but also best for the tremendous competition coming after the present emergency is over.

All orders subject to priority conditions of War Production Board

THE PUSEY AND JONES CORPORATION

Established 1848. Builders of Paper-Making Machinery

Wilmington, Delaware, U.S.A.

THE SIGN OF TRADE MARK SUPERIOR QUALITY

Washington News

BIRD'S-EYE VIEW OF PAPER CONTROL

▶▶▶ A heavy reduction in orders accompanied by a severe drop in production ratios has marked the past month, and accentuates the frequently reported statements that there is no present or immediate indication of a shortage of any of the standard grades of paper.

The present picture appears to stem from the statements made by government officials several months ago that the domestic mills would be unable to approach the 1942 demand for paper. This supposedly authoritative statement from the organization which preceded the present War Production Board organization was flatly denied by the paper industry, but the statements had their effect. It was stated at that time that 1942 demand for paper would total 26,000,000 tons, a figure far greater than the capacity of the American mills to produce.

The result of these statements was forward buying by large consumers. One chain of important magazines is reported to have stocked its entire estimated requirements for two years ahead to anticipate the prophesied shortage. The same forward buying was evident in many other quarters.

Within recent weeks the issuance of orders limiting inventories has combined with the previous heavy buying to heavily reduce shipments and orders. In other words, a material part of 1942-43 requirements was bought and stocked in 1941-42, leaving the market partially saturated. A drop in production ratios from 100.3 per cent of theoretical capacity in April to 95.5 per cent in May and a further reduction to less than 90 per cent during June is concrete evidence of the situation which has developed.

▶▶▶ AN ATTEMPT TO ESTABLISH a general system of priorities procedure by an Allocation Classification has proved exceedingly complicated to the paper mills. A voluminous list of requests for interpretations has been sent to the Pulp and Paper Branch of the War Production Board, and the problems raised are providing headaches for both the mills and the authorities. Under the system certain code letters and numbers must be given each order for material, and the problem of where paper ceases to be a raw material and becomes a manufactured article is predominant.

▶▶▶ THERE HAS BEEN CONSIDERATION to a revision of the chlorine allocation program, as additional chlorine production is becoming available. There are reports, however, that some companies have been guilty of violation of existing restrictions and penalties may be invoked.

▶▶▶ A CONVERTING SECTION has been set up in the Pulp and Paper Branch of the War Production Board to handle various types of converted merchandise, such as bags, envelopes, and other such articles.

▶▶▶ THE TRANSPORTATION SITUATION has become so serious that a Committee for the Pulp and Paper Industry Transportation has been set up as an additional advisory committee from the paper industry. F. E. Hufford of the Pulp and Paper Branch is presiding officer.

▶▶▶ PAPER MILLS are limited to four fourdrinier wires in stock by a copper conservation order.

▶▶▶ THE QUESTION OF PRICES for newsprint has been before O.P.A. authorities on various counts. The question of the port price was one, the mills asking for the elimination of the special price on the basis that there are no longer any water shipments because of the war situation, and therefore no reason for this $1 per ton concession. The other question involves the proposed rise in prices of Canadian newsprint to $53, and the domestic mills have been called upon to show their costs as part of the investigation into the justification of the proposed higher price.

▶▶▶ CONGRESS IS BEGINNING to take notice of the pressure which is being placed on industry by the calls from the horde of government agencies for voluminous industrial statistics. It has been suggested that one master set of statistics be called for from each corporation, and these data be made available to all government agencies. One big electrical corporation has reported that it takes eight full-time experts with 100 part-time accountants to compile the statistics called for by various agencies involved in the war program. In the case of paper, the mills have been called on to provide not only operating costs as a means of determining whether prices charged are justified, but unrelated matters such as salaries of all officers, the extent of stockholding participation by individuals are required. At present, any government agent who feels he needs certain statistics, is able to send out a mandatory questionnaire calling for the statistics which may already have been filed in approximately the same form elsewhere.

STANDARDIZATION TO BE MANDATORY

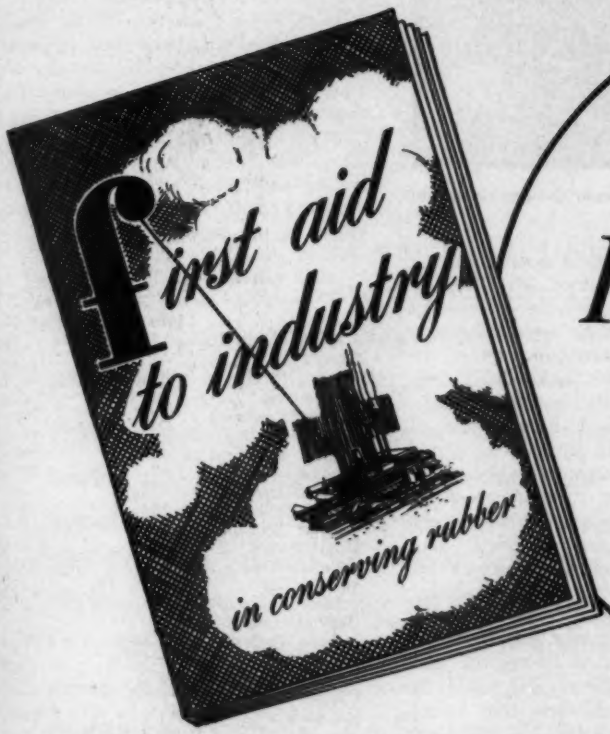
Nearly 1,000 paper manufacturers and merchants heard the officials of the War Production Board's Pulp and Paper Branch announce at a conference at the Waldorf Astoria that standardization of paper sizes and weights will be made mandatory. This meeting was duplicated at a second conference for middle west paper men at Chicago on July 2. At the July 1 meeting at New York it was also announced that eventually there will be pressure exerted to secure the production of essential papers and the industry was urged to devote its attention to the development of new uses of paper as a substitute for other more critical materials. David J. Winton, chief of the Branch, did not state that the production of non-essential papers may be curtailed, but the emphasis was placed on the fact that in case of stress, primary consideration will be given to those mills making essential papers, and future paper classification will be based on the relative essentiality of the various grades.

It was also announced that there will probably be a modification of the stringent rules requiring return loads for all freight trucks. This relaxation is asked on account of the pulpwood truckers, who do not provide return loads. The present rule requiring return loads was to have gone into effect July 1 but the effective date has been deferred to July 15, and some modification may be expected before that time.

The New York conference was staged to give the paper industry an opportunity to understand how the Branch functions, and its objectives. Speakers representing various sections of the Branch told of their special duties.

SAVE RUBBER

FOR UNCLE SAM'S FIGHTING FORCES



←This Free Booklet tells you How

TO HELP YOU obtain service beyond normal from your rolls, belting, hose and other industrial rubber products, we have placed years of "U.S." experience at your disposal—through our sales engineers and in a 44-page illustrated booklet entitled "First Aid To Industry In Conserving Rubber."

Facts contained in this booklet will enable you to take advantage of the finest available information on industrial rubber conservation. The practice of these precautions *today* may avoid costly breakdowns *tomorrow*—with resultant loss of production, possible damage to equipment and injuries to personnel.

The explanations in this booklet are clear, concise, and they are written in language which operating men understand. Special sections are devoted to the installation and maintenance of mechanical rubber products commonly used in the paper industry, such as . . .

- Rubber-Covered Rolls
- Rubber-Lined Equipment
- Hose—Machine, Steam, Fire
- Mechanical Packings
- Transmission and Conveyor Belting
- Electrical Wire, Cords, Cables, and Tapes
- Mats and Matting

We will gladly send you a copy of this booklet upon request.

"Service Beyond Price and Specifications"

UNITED STATES RUBBER COMPANY

1230 Sixth Avenue • Rockefeller Center • New York

Group of employees added to Honor Roll in 1942 at Hammermill Paper Company's annual Honor Day ceremonies.

HAMMERMILL HOLDS ANNUAL HONOR DAY

More than 50 men and women of the Hammermill Paper Company, Erie, Pennsylvania, were honored at the company's annual Honor Day ceremonies held on June 21. Honor Day is set aside each year for the recognition of employees who have served the company from 20 to 40 years.

Norman W. Wilson, president of Hammermill, addressed the gathering, stressing the organization's part in the war effort. Each honored employee received an award consisting of a gold watch, a share of company stock, or an official diploma, depending on his years of service.

In the different groups those honored were: 35 in the quarter-century group; 18 in the 30-year group; three in the 35-year group; and one in the 40-year group.

The annual Honor Day was inaugurated by the Behrend family who founded the Hammermill company.

♦

RUMOR THAT CAN. NEWSPRINT WILL BE UNDER VINING

Charles Vining, president of the Newsprint Association of Canada, has been requested by Prime Minister Mackenzie King to review the matter of Canadian publicity in the United States, and news from Ottawa indicates that after he has presented this report, Mr. Vining will be appointed newsprint controller under the Wartime Prices and Trade Board, succeeding G. M. Smith of Montreal, who is resigning to enter the army.

This does not mean the inauguration of a new policy, but it does mean that in selecting a man of Mr. Vining's standing and authority, the government intends to see that the newsprint policy is wisely administered in view of the importance of the industry in contributing to Canada's balance of trade. Should a dry period affect the flow of water later on, the situation in regard to power may become complicated in view of the large requirements of the ever-increasing production of aluminum and other war materials. This may bring shortages of hydro-electric power in some newsprint producing centers and reallocation of newsprint orders so that they may be most advantageously distributed among the various mills, and the regular supply to United States publishers thus be assured. Another aspect is that some newsprint mills form the sole means of livelihood for various isolated centers of industry, disruption of which would have serious local consequences.

♦

FINANCIAL

The allied reverses in Russia and Libya served to weaken the American securities markets which took heart from the American successes at Midway, and paper mill securities generally responded to the general market tone. Sales of the less well-known securities, however, dried up, holders preferring to hold their stocks rather than dump them on a weak market, with the result that many quotations are merely nominal.

Allied Paper Mills—Net profit for 1941 was $497,229 as against $340,588 in 1940.

Gaylord Container Corporation — Net profit for the March quarter was $273,133 as against $211,838 for the same period in 1941.

Hollingsworth & Whitney — Net profit for 1941 was $1,467,379 as against $521,538 in 1940.

Masonite Corporation—Net profit for the third quarter of 12 weeks, March 15, 1942, to June 6, 1942, after all deductions was $510,215 as against $534,591 for the same period last year.

National Container Corporation — Net profit for the first quarter of 1942 was $294,593 as compared with $225,618 for the same quarter in 1941.

Scott Paper Company—Total consolidated net sales, including all subsidiaries, for the first five months of 1942 were $13,859,748 as compared with $9,581,204 in 1941.

West Virginia Pulp & Paper Company—Net profit for the six months ending with April was $2,513,629 as against $2,206,428 for the comparable period in the previous year.

New York Stock Exchange—Stocks

	Closing Prices June 25	May 25
A. P. W. Paper Co.	1⅜	1⅜
Celotex	7	6⅞
Same Preferred	*68–69½	69¾
Certain-teed	2	1⅞
Same Preferred	*24¼–24⅞	24¼
Champion P. & F. Co.	*14⅜–14⅝	14½
Same Preferred	*94½–99	97½
Container Corp.	12	12¾
Cont. Diamond	6⅞	7½
Crown Zellerbach	10⅜	10¼
Same Preferred	*77½–80	77
Dixie Vortex	*8¼–8⅜	8⅛
Same "A"	33½	35½
Robert Gair	*1½–1¾	1¾
Same Preferred	*9⅛–10	9½
Gaylord Container	*8¼–9⅜	9
Same Preferred	*49–50½	*50-51
International Paper	9¼	9⅞
Same Preferred	47	50¾
Kimberly-Clark	24½	27¼
MacAndrews & Forbes	*17–19	16¾
Masonite	*25¼–25¾	23
Mead Corp.	*6⅜–6⅞	6¼
Same Preferred	*68–76	*71–75
Paraffine Cos.	*25½–28	24½
Same Preferred	*90½–100	*80–85
Rayonier	8¼	8⅜
Same Preferred	*23½–24½	25
Scott Paper	*30¾–32½	29⅛
Same 4½% Pfd.	*112½–116	*113–116
Same 4% Pfd.	*107–109	107½
Sutherland Paper	*19–19½	19⅞
Union Bag & Paper	8	8½
U. S. Gypsum	*47–47¼	43½
Same Preferred	*165-170	162

New York Stock Exchange—Bonds

Abitibi 5%	48½	45¼
Celotex 4½%	97¾	95½
Certain-teed 5½%	.....	85½
Champion P. & F. Co. 4¾%	.....	104⅞
International Paper 5%	.....	103⅞
International Paper 6%	104¾	104⅞

New York Curb Exchange—Stocks

Am. Boxboard	.....	4⅛
Great Northern	.....	27¼
Hummel Ross	3⅛	4⅛
Nat. Container	.....	8¼
St. Regis	1⅜	1⅜
Taggart	.....	2⅜
United Wall Paper	1⅛	1⅛

*Closing Bid and Asked Prices.

Design

Fig. 1814
All Iron Flanged End Gate Valve
Sizes 2" to 30"

Design is what makes one airplane fly higher and faster than another. It makes one gun shoot farther and straighter than another. One tank hit harder than another.

Design is what makes Powell Valves perform better and last longer in the industrial tasks to which they are assigned. It is exemplified in the vast assortment of special valves built to do special jobs that make up the Powell Line. It is carried on by a corps of highly trained experts working with the most modern technical equipment available. It will continue to represent the part that Powell has played and is still to play in the forward march of Industry.

The Wm. Powell Company
Cincinnati, Ohio

Fig. 487
All Iron Flanged End Globe Valve
Sizes 2" to 12"

These All Iron Valves have bolted yoke top and outside screw rising stem. They are available with or without removable seats. Can be furnished for 125 or 250 pounds working pressure.

(Where higher pressures are desired, use Powell All Steel Valves).

All Iron Valves are especially adapted for handling concentrated sulphuric acid and innumerable other compounds destructive to non-ferrous materials.

POWELL VALVES

POWELL RIVER MILL ADDITION PROGRESSING

In June, 1941, Powell River Company, Ltd., Powell River, British Columbia, announced that pursuant to agreement with the Dominion Government, construction of addition to the sulphite pulp mill, totalling approximately one million dollars, would proceed immediately. (Cf. THE PAPER INDUSTRY AND PAPER WORLD, Page 322, July, 1941.)

Since that time work has steadily progressed, and the new sulphite screen room is taking shape. When construction is completed, the company's production of high grade pulp will be brought up to 125 tons per day. The bulk of this will be exported to the United States, providing Canada with additional American exchange.

The new addition to the sulphite pulp mill at Powell River Co., Ltd., Vancouver, B. C. is progressing. The above illustration shows the stage of construction a few weeks ago.

◆

DEVELOP A NEW PAINT CONTAINER MADE OF PAPER

After several months of experimentation at the Chicago plant of The Sherwin-Williams Company, a new paint container has been developed. The top and bottom are metal discs, but the body is made entirely of cardboard impregnated with an insoluble substance.

The biggest problem in developing the paper paint can was finding a method of moisture-proofing the cardboard. The common ice cream container could not be used because it would soak up the oils and solvents in paint, resulting in a soggy can and deteriorated contents. This was overcome by chemically treating the cardboard and placing an impregnated paper lining inside the can to prevent "wicking" or absorption.

The company does not claim that the new substitute is just as good as an all-metal container. However, this paper can has been tested ex-

KNIFE GRINDING

For Better Cutting Knives, Lower Operating Costs

Latest Covel-Hanchett Traveling Wheel Grinder

Provides the most effective action of any grinding service. Smooth running, short length, compact. Never before so much machine in so little space. . . . Preloaded, precision bearings, protected, force feed lubrication. . . . Paper knives and doctor blades reach a new high in accurate, smooth finish with less stock removed, less grinding expense. Sustained accuracy in grinding operations means less grinding for better results; saves knives, wheels and operating cost. . . . Catalogue on request to the Pioneers in the industry.

COVEL-HANCHETT CO.

Big Rapids, Mich., U. S. A.

Why it pays to keep in touch with your Calco Representative

There's no time to lose
There's just time to WIN
Calco

HELLER & MERZ DEPARTMENT
CALCO CHEMICAL DIVISION
AMERICAN CYANAMID COMPANY

Bound Brook, New Jersey • 30 Rockefeller Plaza, New York, N. Y.
Boston • Chicago • Springfield, Mass. • Philadelphia

Quite frankly, supplies of dyes and related chemicals are "subject to change without notice" these days. Changing demands for government requirements—re-alignments in priorities and allocations—variations in demand for civilian use affect the availability of scores of colors almost from week to week. Some can be furnished only on priority, but many, many others can be furnished in ample volume. Even among these, there is unavoidable uncertainty as colors which may be scarce today may be plentiful tomorrow—and vice versa.

A practical solution to this difficulty is to keep in touch with your Calco representative as you plan your production. He has a constant, up-to-date check on what colors are available—which require priorities—and the likelihood of replenishing supplies which are currently short. So keep in touch with your Calco representative by phone—or better still, ask him to call—you'll find him a worth-while member of your "ways and means" committee.

tensively for wicking, for evaporation, and for shipping and storage qualities, and has proved completely satisfactory in each respect.

◆

PAPER AUTO TIRES

Paper tires, although as yet in a purely experimental stage, have been produced at the Milford (New Jersey) plant of the Riegel Paper Corporation by George L. Bidwell, vice president and general superintendent. These tires are manufactured from paper which is made from old khaki uniforms and compressed under hydraulic pressure. They have proved fairly successful in driving tests on the car of Norman Applegate, plant engineer, and are undergoing further testing and experimentation at the present time, and work on the improvement of the original will be continued.

Instead of the full rounded surface of a pneumatic tire, these tires present a flat surface to the pavement, like a wagon wheel. They are made from circles of paper, the inside diameter of which is 18 in. and the outside diameter 28 in. They are now 5 in. thick, but it is hoped to get them down to 2½ in. later. About ¾ in. of the paper protrudes over the steel rim and holds it together, and as this is worn down, the steel rim is cut away to permit further wear. These paper tires have about the same traction as a rubber tire, but are noisier.

◆

GOVERNORS TOUR ECUSTA PLANT

One of the most distinguished groups ever to make an inspection tour of an American industry, paid the Ecusta Paper Corporation a special visit on the afternoon of June 24, when governors attending the 34th annual National Governors Conference in Asheville, North Carolina, drove out to Pisgah Forest to be the luncheon guests of Harry Straus, president of the company, and to see how fine cigarette paper is manufactured. A party of approximately 200 persons, including more than 20 governors, their wives, high state officials, and leading North Carolina businessmen, made the trip as the concluding feature of the four-day governors conference.

Mr. Straus welcomed the guests to the plant, and, jokingly reminding them that they had already listened to enough speeches during their conference at Grove Park Inn, invited them "just to relax" at Ecusta.

Before starting with his guests on a thorough tour of the huge plant, Mr. Straus informed the group that the Ecusta firm, in addition to supplying about 80 per cent of the cigarette paper used in the United States, is also serving a number of allied nations through lend-lease arrangements of the Federal Government.

Automobile tires made of paper are receiving tests at the plant of Riegel Paper Corporation, Milford, New Jersey. This venture is still purely experimental.

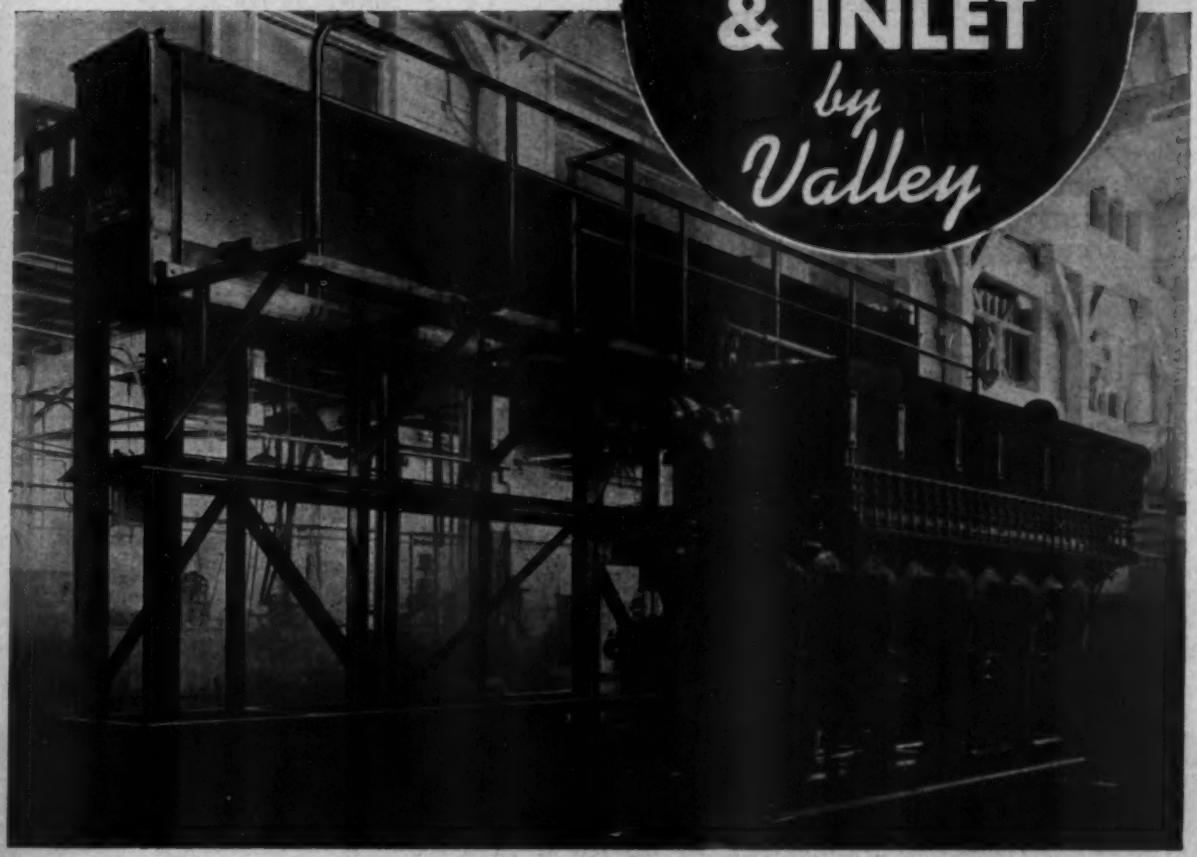
The group was then taken through the filter plant, with its capacity to filter 25,000,000 gallons of water a day, and from there through other new buildings in which raw flax is converted into fine cigarette paper. They also inspected the Champagne Paper Corporation, which converts the finished cigarette paper into booklets for those who like to "roll their own," and the Endless Belt Corporation, which weaves belts for use on cigarette machines. Mr. Straus is president of both of these concerns.

When governors attending the 34th annual National Governors' Conference in Asheville, North Carolina visited the Ecusta Paper Corporation, Pisgah Forest, they were entertained at luncheon by the company's president Harry H. Straus. A section of the luncheon table above shows (L to R) Gov. J. Melville Broughton, of North Carolina; Mrs. Harold E. Stassen, wife of the governor of Minnesota; Mr. Straus; Mrs. Broughton; Governor Stassen, and Mrs. S. Clay Williams, one of the guests.

CUSTOMER "COMMUNIQUES"

ON A RECENT INSTALLATION

HEADBOX & INLET by Valley



APPEARANCE ▶ "The best-looking equipment that ever came into this mill."

DESIGN ▶ "We have never received any equipment that showed so much engineering and fine, shop details . . . and as to formation, here are some of our samples. When are you coming up to see your equipment?"

PERFORMANCE ▶ *May 20*—"The equipment for #1 has come in . . . if it performs as well as it looks, we will be well-satisfied."

May 25—"Started up #1 this morning and after seeing the new sheet, we hate to look at #3 . . . how soon can you get your erector here to install #3?"

June 1—"Started making paper on #3 at 7:00 A.M. . . . we're pretty happy . . . sending you samples and photographs."

★ *Reference list of other Valley Inlet and Headbox users gladly furnished.*

VALLEY IRON WORKS CO. • APPLETON, WISCONSIN

Slices and Head Boxes · Screw Presses · Micro-Mist Spray Dampeners · Laboratory Equipment
Pulp Washing Systems · High-Speed Beaters · Breaker Beaters · Vortex Beaters · Plug Valves
Sutherland Refiners · Flat and Rotary Screens · Thickeners · Deckers · Paper Markers · Roll-Headers

Booklets printed on cigarette paper and telling about Ecusta were distributed to each of the guests.

The visit was of particular interest to Governor Harold E. Stassen of Minnesota. A large amount of the flax straw from which cigarette paper is made comes from Minnesota, and the Ecusta plant is at present conducting experiments on growing the flax in soil brought to Pisgah Forest from Minnesota.

"This feels just like home," Governor Stassen commented as he scooped up a handful of the black dirt and let it run through his fingers.

◆

CAN. PULPWOOD COMMITTEE GETS NEW WAGE RATE

A new schedule of wage rates for forest workers in the Province of Quebec for the 1942-43 season, submitted by the pulpwood committee of the pulp and paper industry of Canada, was approved and accepted early in June by the Quebec Regional Labor Board. The new schedule divides the Province into three zones; namely, zone one, south and west of the Lake St. John region and south of the St. Lawrence and the Gaspesia regions; zone two, the whole Lake St. John region; and zone three, north shore of the St. Lawrence River from the Saguenay River up to Labrador.

The new rates call for a wage scale covering more than thirty forestry occupations, ranging from cookee up to tractor driver. Comparative figures are unavailable, but the new scale ranges from minimum and maximum of $1.17 and $2 for cookees, and minimum and maximum of $2.31 and $5.50 for tractor drivers.

◆

PRIORITIES DEFER COMPLETION OF RED ROCK PLANT

Directors of the Brompton Pulp & Paper Company, Ltd., Bromptonville, Quebec, have announced that completion of the plant at the recently acquired Red Rock property is being deferred. Most of the necessary material and equipment was available in Canada, and, since the new plant was to have filled certain special war requirements, the company had the full approval of the Department of Munitions. However, certain essential equipment had to be obtained from American sources, and due to the sweeping revision of the American War Production Board's priorities system, recently made effective, it is no longer available.

Later developments in regard to the property will be based on the normal business requirements of the company. In the meantime, the company will operate the pulp mill at Nipigon and will continue woods operations in the Thunder Bay District—both of which will provide an important source of revenue.

◆

PUBLIC ASKED TO INSIST ON HAVING PACKAGES WRAPPED

There is a mistaken belief prevailing that a shortage of paper—boxes, containers, bags, etc.,—all forms and grades exists. This was no doubt started from the Government's appeal to the public to save wastepaper; however, wastepaper is now being saved in sufficient quantities to permit mills to run full with a capacity large enough to supply all war and civilian needs, and the attempt to save paper by improper packaging only results in increased breakage and waste of critical and valuable merchandise and material, and the threatened health and sanitation of the nation.

This needless saving also reduces mills to part-time operation, throwing thousands of men out of work, and leaving no outlet for the accumulation of wastepaper.

There is no shortage of paper or paper articles, and a patriotic duty will be filled by insisting upon proper packaging in new materials of all purchases.

BRIEFS

▶▶▶ ONE OF THE LARGEST SCOWS built in Three Rivers, Quebec, for a number of years was launched recently by the St. Maurice River Boom and Drive Company, carrying out the construction for the Consolidated Paper Corporation (Wayagamack Division). Named the "Waco," the scow is 80 ft. in length, has a beam of 20 ft., and the registered tonnage is 85.

◆

▶▶▶ THE A. P. W. PAPER COMpany, Albany, New York, has filed a denial to the charges made before the Federal Trade Commission that it had misrepresented its merchandise by use of the Red Cross emblem. The company points out that its use of the Red Cross as part of its trade-mark, for which registration was granted, does not indicate that the American Red Cross Society is misleading to purchasers.

◆

▶▶▶ LAST YEAR, FOREST FIRES in Canada raged over 4,250,000 acres, causing total damage of $13,242,179, including the cost of fighting the blazes, the worst forest fire year since 1923. The average loss in the previous ten years was $4,498,463. Actual cost of fighting the fires last year was $1,307,059, an increase of about $500,000 over the ten-year average.

◆

▶▶▶ THE APRIL, 1942, issue of *The Years of Paper*, published by Crown Zellerbach Corporation, San Francisco, California, contained news and special illustrations of the graduation, on March 11, of forty-one four-year students from the Crown Willamette Paper School at Camas, Washington. Albert Bankus, vice president, presented the diplomas after a banquet and graduation ceremonies held at the Crown Willamette Inn at Camas. This is the largest class to complete the four-year course since the school was founded nine years ago.

◆

▶▶▶ COAST GUARDSMEN have been placed on watch on the 125-ft. lookout tower on top of the sulphite building of the Northern Paper Mills, Green Bay, Wisconsin. The men work in four-hour shifts, day and night, watching over city and waterfront activity. Searchlights and both hand and electric sirens are included in their equipment, as well as phone connections to the coast guard house.

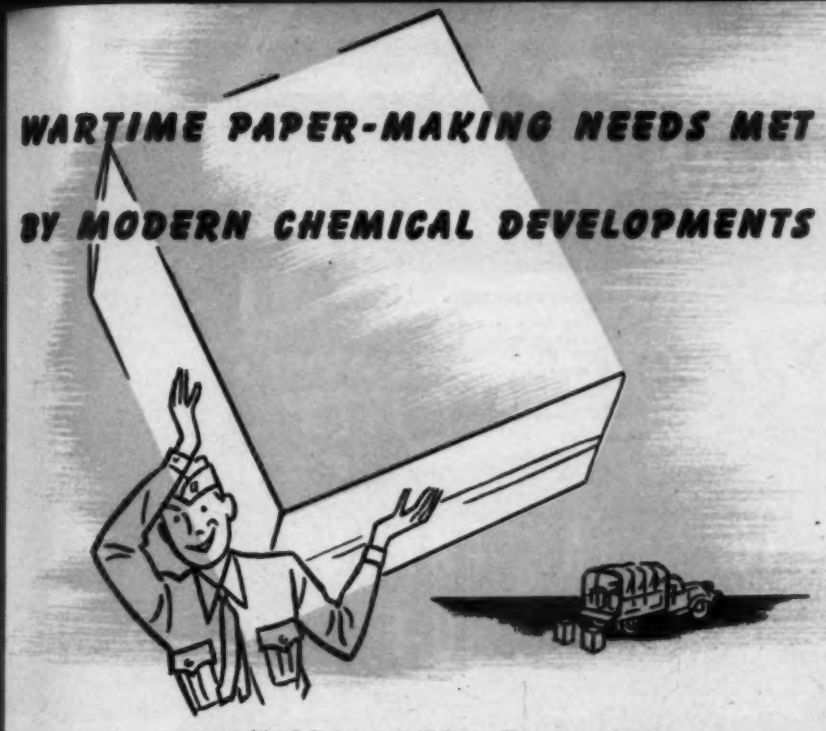
◆

▶▶▶ SPECIAL REGULATIONS posted by the Wisconsin conservation commission this spring to meet hazardous forest fire conditions have been rescinded because of heavy rainfall, and visitors will be allowed their usual outdoor freedom. However, the regulations will be reinstated whenever conditions make it advisable.

◆

▶▶▶ CEILING PRICES OF PULPWOOD produced by farmers, settlers, or operators in Quebec, New Brunswick, and Nova Scotia, for use in Canada were announced by the Wartime Prices and Trade Board on May 1. The announcement, issued on behalf of Timber Administrator A. S. Nicholson, stated that Quebec had been divided into 27 natural producing districts, and a schedule of ceiling prices which may be demanded or accepted was established for each district.

WARTIME PAPER-MAKING NEEDS MET BY MODERN CHEMICAL DEVELOPMENTS



WAR BRINGS NEW DEMANDS. Never before has so much been demanded of paper. The requirements of paper making for normal uses have not only become more difficult to meet, but paper is also expected now to step in and replace other materials such as metals, wood, glass, and fabrics.

American paper manufacturers had already made considerable progress along these lines before the influence of the war became a factor. But now the present emergency has intensified and diversified the demand tremendously. As a result, paper and paper boards are being successfully adapted to uses that would have been considered by many as being practically impossible only a few years ago. To illustrate . . .

Machinery, food products, clothing, munitions, medical supplies, and hundreds of miscellaneous light and heavy weight, durable, fragile, and perishable articles are being packed and shipped to our armed forces in every quarter of the globe in packaging materials made in many cases entirely of paper and paper board. These protective coverings have got to be good to withstand punishing handling and the effects of sun, wind, hail, rain, snow, cold, heat, and humidity.

PROGRESS BEING MADE. To give paper and paper board the properties that will make them stand up calls for a number of special paper manufacturing treatments, some of which are new to many paper makers. For years prior to the entry of the United States into the conflict, Cyanamid had been working successfully on many developments in paper chemicals and their uses in broadening the fields of paper applications. Much of this is now proving of vital importance in releasing critically needed materials for the war effort. A lot has been done, a great deal more is under way, and Cyanamid may be able to help you in your efforts to make paper do its full share in the winning of the war. A Cyanamid representative will be glad to discuss the matter with you, and arrange to give you all possible assistance.

Rigid, damage- and water-resistant cartons of specially sized paper board made to U. S. Government specifications are now used for storage and shipment of munitions supplies.

"Food will win the war and write the peace that follows." The job of the Quartermaster Corps in getting foodstuffs to the armed forces has been considerably alleviated by the many types of efficient cartoning materials developed to keep perishables in good condition.

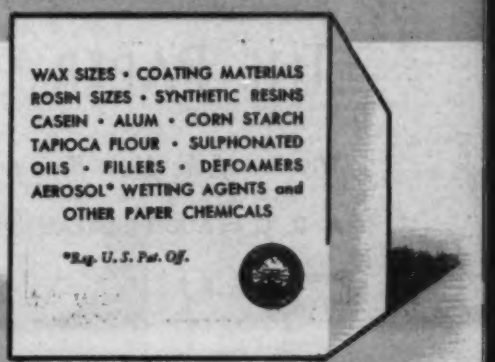
Paper board sidings now keep out the cold and otherwise effectively insulate both temporary and permanent shelters for soldiers and workers in war industries.

American Cyanamid & Chemical Corporation

A Unit of American Cyanamid Company

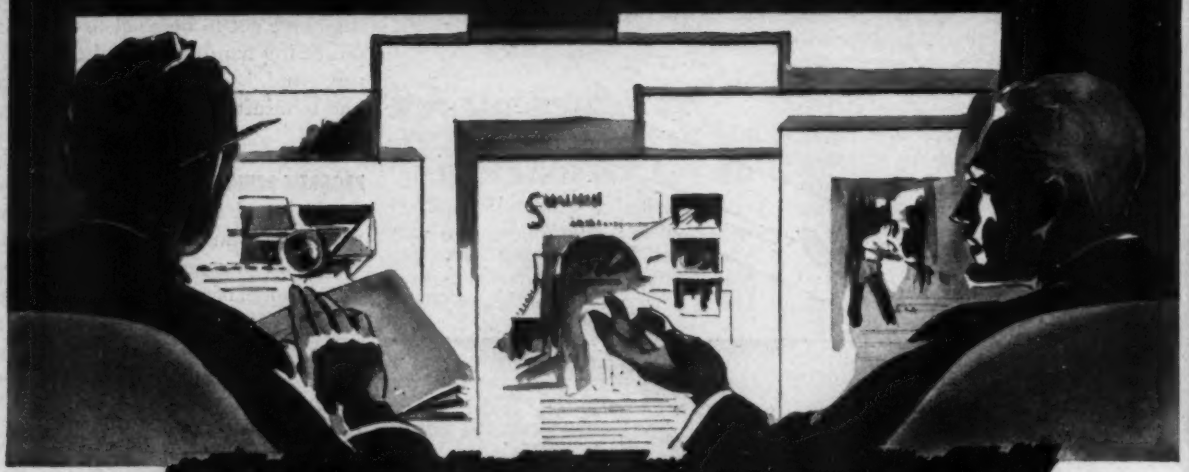
30 ROCKEFELLER PLAZA • NEW YORK, N. Y.

DISTRICT OFFICES: Boston, Massachusetts; Philadelphia, Pa.; Baltimore, Maryland; Charlotte, North Carolina; Cleveland, Ohio; Chicago, Illinois; Kalamazoo, Michigan; Detroit, Michigan; St. Louis, Missouri; Azusa, California


WAX SIZES • COATING MATERIALS
ROSIN SIZES • SYNTHETIC RESINS
CASEIN • ALUM • CORN STARCH
TAPIOCA FLOUR • SULPHONATED
OILS • FILLERS • DEFOAMERS
AEROSOL® WETTING AGENTS and
OTHER PAPER CHEMICALS
®Reg. U. S. Pat. Off.

"HOW DO WE KNOW?"

—asked the President



"WE INVESTIGATE BEFORE WE INVEST" — said the advertising manager, and tells his President how the use of available facts protects their advertising investments.

President: "That's a good looking campaign. The illustrations are stoppers. The copy is interesting and to the point. Now where do we go from here? How do we *know* that the publications in which we plan to run these ads are the best ones to do the job? And then how do we know that we get what we pay for? Or don't we?"

Advertising Manager: "We know because we investigate before we invest. Our choice of media is based on facts from reports issued by the Audit Bureau of Circulations, a self-governed association of advertisers, advertising agencies and publishers. Working with the publishers we have set up definite standards for circulation and provided methods and means for measuring and verifying the circulation of the publisher members.

"Take business papers for instance: A.B.C. reports show how much circulation a publication has, how it was obtained, how much people pay for it, where it goes, the percentage of renewals and other facts that make it possible for our agency to select the papers best suited to our needs and to tell us just what we will get for our money. When you see 'A.B.C.' after the names of publications on our advertising schedules, it means that our selection is justified by the verified information in A.B.C. reports."

President: "Good. That's the way it should be. Why hasn't someone told me these things."

SEND THE RIGHT MESSAGE TO THE RIGHT PEOPLE

Paid subscriptions and renewals, as defined by A.B.C. standards, indicate a reader audience that has responded to a publication's editorial appeal. With the interests of readers thus identified, it becomes possible to reach specialized groups effectively with specialized advertising appeals.

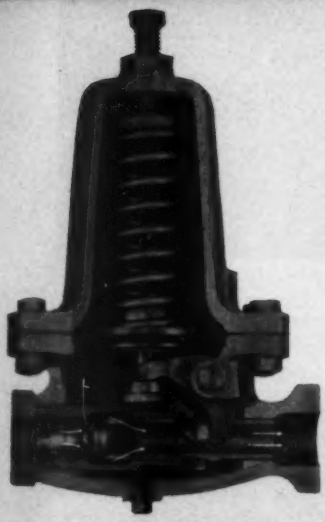
THE PAPER INDUSTRY AND PAPER WORLD

Member of the Audit Bureau of Circulations ABC *Ask for a copy of our latest A. B. C. report*

A. B. C. = AUDIT BUREAU OF CIRCULATIONS = FACTS AS A MEASURE OF CIRCULATION VALUES

Your CASH STANDARD Streamlined TYPE 1000 PRESSURE REDUCING VALVES

ARE IMPORTANT PARTS OF YOUR PRODUCTION SET-UP *Now* AND ANYTIME



HERE'S THE "1000" FLOW PATTERN
The Streamlined form of the inner valve eliminates turbulence. It produces the flow pattern shown above which makes for maximum capacity when it is needed most and permits accurate pressure control under toughest working conditions.

You can find out full details on all of the Type 1000 benefits by reading Bulletin "1000" —send for it!

Have you forgotten yours too?

Probably you have forgotten that you had CASH STANDARD Streamlined Valves on your lines though it is a number of years since you purchased them. We can assume this because we have often received letters that read in part like this: "The '1000' valves are honeys. The fact that we don't ever have any trouble with the ones we have installed tends to make us forget them."

Good position to be in

When equipment performs so well that it is forgotten, the user is in a good position. Particularly is this true today when speedier production is demanded and the elimination of lost production hours due to "time out" for troubles is essential. So, if you have "1000" valves in your service now, here is one source that is making a valuable contribution to your speed and cost saving efforts.

Inexpensive Renewal Parts

Experience in thousands of installations show that even after long use, only the valve seat and the seat ring show wear. You can make these simple replacements in your own plant — no delays in returning the valve to us. Rehabilitation of the entire valve is thus easily, quickly, and economically accomplished.

A. W. CASH COMPANY
DECATUR, ILLINOIS

CASH STANDARD CONTROLS . . VALVES

A CASH STANDARD "GET ACQUAINTED" COLUMN

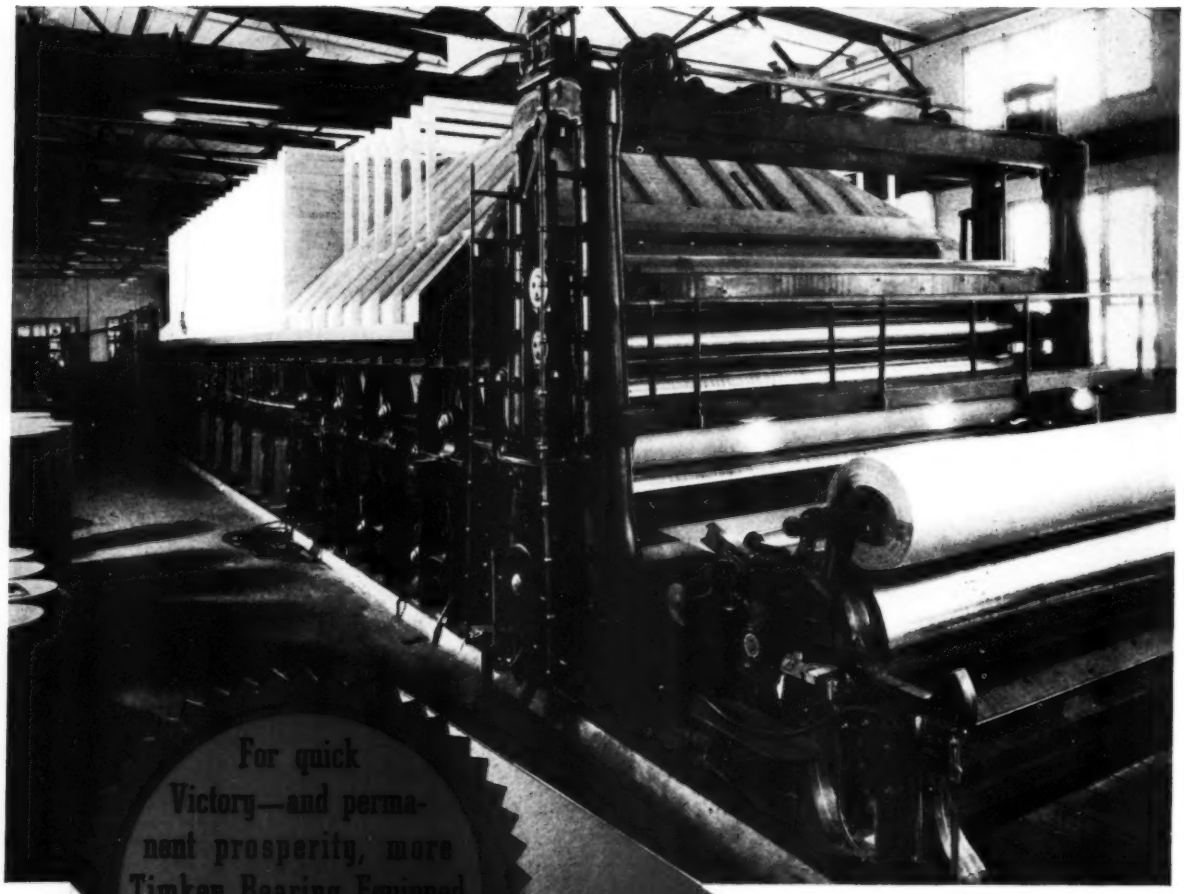
Question: **"Don't you people make anything besides that Streamlined Valve you talk about so much?"**

Answer: **"Yes Sir; we do! And we propose to picture one or two of them here each time."**

For precision jobs — the CASH STANDARD "42-R" Balanced Lever Valve. No lost motion; practically no maintenance. Heavy renewable seat rings; valve stem integral with inner valve. Roller guides kill side strains and stop packing trouble. Comes with parabolic inner valve; flat bevel seat; V-port seat; and V-port non-seating types. Made in sizes ½" to 12" inclusive. For use with pressures up to 600 lbs. Highest temperature 800 deg. F. In iron, bronze, and steel bodies; all standard trims. This valve is made also with center guide, and with Water Cooled, or Air Cooled Packing Box.

Where valve failure would be costly, here are two "42-R" valves operated by CASH STANDARD Type 100 Automatic Controllers, in two-stage pressure reduction. First stage: a 6" Valve reducing 150 to 50 lbs. gauge; second stage: an 8" Valve reducing 50 to 5 lbs. gauge. Load 70,000 lbs. steam per hour. Nearly four years' daily use; not a moment's trouble. (Single stage would have been entirely satisfactory, but customer insisted on double stage reduction.)

Get Free Bulletins on Above . . . Write to A. W. CASH COMPANY DECATUR, ILL.



For quick Victory—and permanent prosperity, more Timken Bearing Equipped machines and more Timken Bearings per machine. Redesign now.

Timken Tapered Roller Bearings have done a particularly good job on the intermediate calender rolls of this 202" Beloit High Speed Tissue Machine.

This is an exceptionally severe thrust application, and all sorts of bearings were tried without success until the present Timken Bearing mounting was devised; then the problem was licked, and Timken Bearings have performed very satisfactorily ever since.

Paper mills are full of tough jobs for bearings, but there isn't one that Timken Bearings have not mastered or cannot master.

Paper is important to America's war effort. Your machines will produce more and better material if they are equipped with Timken Bearings — and reduce costs at the same time.

THE TIMKEN ROLLER BEARING COMPANY, CANTON, OHIO

TIMKEN TAPERED ROLLER BEARINGS

TO ASSURE VICTORY
BUY UNITED STATES WAR SAVINGS BONDS & STAMPS

Editorial

Let Us Win the War

▶▶▶ THE PRESENT SITUATION in the paper industry is one of confusion. Enthusiastic compliance and co-operation with the War Production Board's Priorities Regulation No. 1, last fall, drove the Industry ahead to a 100 per cent production basis and to a net gain in a war year of 21 per cent. Recently, there has been so drastic a falling off of orders that some mills face indefinite shutdowns.

What caused this rapid transition from peak production to such a low level of operation?

What can be done about it?

Does anyone have the answer?

The control of the Industry's operations is vested in the Pulp and Paper Division of the War Production Board. Isn't it logical for confused members of the industry to look to that body for clarification and guidance at this time?

All pulp production was put under government control by a War Production Board pulp allocation order (M-93), issued March 12, effective May 1. Now comes Priorities Regulation No. 10, issued at Washington as of June 1, 1942, with July 1 as the mandatory date. This regulation, defined as an Allocation Classification System, is applicable to nearly 1,000 commodities made by all industries in the country, including the paper industry.

No one questions the authority for the regulations which have been set up. These are wartimes and the Government has the authority to control.

What puzzles some individuals in the paper industry, however, is the allocation of an industry's products when no shortage exists. There is no shortage of pulp. There has been no shortage of paper. So why allocate when the law of demand and supply of itself has effected a drastic bit of allocation?

The people of the paper industry are patriotically enlisted to win the war, and no sacrifice is too great for them to make to achieve that objective. They yearn, however, for sound, forthright leadership. They know that without it, all efforts to achieve will result in mistakes, costing time, money, material, and life.

Isn't there some way for the present confusion to be speedily resolved and dispelled? Would it be apropos for the Pulp and Paper Division of the War Production Board to lay before the Industry its problems and its plans for an all-out winning of the War? It is believed that the Division would be gratified at the ready response of the industry to all such plans, cost what it may.

Surely, the consensus of opinion of the Division and the Industry in regard to these problems should be better than the convictions of any one individual. At the same time, it should be more effective than the actions of its most aggressive member.

Let us concentrate on winning the War!

Preparation

▶▶▶ IT IS GOOD STRATEGY to prepare for tomorrow. Abraham Lincoln did it when he studied by light given off by burning pine knots in the fireplace of his simple pioneer home. The knowledge gained from such home study permitted him to take advantage of opportunity when it came to him.

The success of the pulp and paper industry of the future will be linked very definitely with the preparation that is given to it by the industry of today. Most certainly, the industry, like every other industry (in fact, every individual), is being brought face to face with changes nearly every day. Some of these changes may be of little consequence; others are of vital importance if the industry is to grow and prosper.

In the final analysis, the burden of responsibility for maintaining the future security of the industry falls upon management. It is a big responsibility that cannot be emphasized too strongly.

In the opinion of Jacob Kindleberger, chairman of the board, Kalamazoo Vegetable Parchment Company, tremendous changes are now forming around the corner and will be with us whether we like them or not. He also says that the napping time for management is over; that the alarm clock is ringing; and that the handwriting on the wall is: *Think, plan and keep everlastingly at it.*

Good advice at any time, to be sure, but particularly good now.

Our Song of Victory

▶▶▶ THE MONTH OF JULY is an important month in the victory of our country. And the Fourth of July never before has held so much significance as it did this year. Independence Day had a new meaning in 1942; it symbolized all of the principles and traditions that have become a part of our Nation.

The National Publishers Association asked all periodicals to display the flag on the cover of their July issues, and there has been a nation-wide response from the publishers.

In tune with the flags that fly from homes and buildings throughout the United States is the national anthem. We hear "The Star Spangled Banner" more often than before, but so frequently only the first verse is sung. Americans should study the meaning of the other verses of our national "theme song" and draw therefrom greater inspiration and pride. The last verse has a particular meaning just now:

"Oh! thus be it ever when freemen shall stand
Between their loved home and the war's desolation;
Blest with vict'ry and peace, may the Heav'n-rescued land,
Praise the Pow'r that hath made and preserved us a nation.
Then conquer we must, when our cause it is just,
And this be our motto; "In God is our trust."
And the star-spangled banner in triumph shall wave
O'er the land of the free and the home of the brave."

Current Thought

THE GOOD PEACE TO COME

WILLIAM SIBLEY

▸▸▸ THIS WAR, LIKE ALL OTHER WARS, is a war of destruction. In a larger sense this war is a war of *con*struction. It is a war that will have as its end a lifting of the standards of living for all peoples and all races. It is a war that will disseminate the American way of life to the far-flung corners of the globe. It is a war that will bring about the development of new and strange machines, new farm crops, new markets, whole new industries. It is a war that will bring a period of prosperity unparalleled in all history.

Yes, I'm bullish on the future. I believe I have reason to be. The longer this war continues the larger will become the backlog demand for durable goods of every description. In contrast to any other war in history this is a struggle of mechanized forces rather than manpower; it develops acute shortages of many basic materials, which alone sharpens the need for substitutes. The shortage of manpower has as its concomitant the development of new and more efficient tools and machines. Curtailment in the manufacture of consumer goods provides both the time and the incentive for designers, engineers, and technicians to develop new models radically different and radically better than anything thus far known. As a single instance, this war effort has relieved the automobile designer from the pressure of the annual show, with the result that he now has the time to design a model which will be without benefit of horse and buggy heritage.

World War I pointed the way to the development of commercial aviation. This war will bring forth civilian aviation—and an aviation industry which will approximate the automotive industry in size and influence. Previous wars have had little concern over highways and bridges. This war is being fought with tanks and mechanized units so heavy as to crush our present standard of asphalt or concrete highway and make a tangled mass of beams out of our hitherto adequate bridges. Airplanes in the war are flying at heights of five, six and seven miles—and the things the designing engineers are learning about insulation, ventilation, and air conditioning will, peace-day, be put into practice in the modest homes which must be built. Alaska, China, Manchuria, Tibet, Australia, Africa, and other remote places will be cut to accessibility by monstrous highways and railroads. These, of necessity, will will be made by American machinery, since American soldiers and engineers are now fighting on the four corners of the globe and they realize that however cheap the foreign labor it is dear in comparison with the efficiency and speed of American machines. Many of the war production plants and their mushroom cities around them will be devoted to the production of shovels, draglines, scrapers, derricks, and all the rest—for China, India, Africa, and South America.

After every other war, peace-loving Americans were so surfeited with war, killing, and casualties that immediately upon the signing of the Armistice we threw our war machinery into dump heaps to rust or burn. Not so, this time. We will have not only a far higher stake in world affairs, come peace, than ever before, but with the shrunken world it will be imperative that we maintain a much larger standing army, navy, and air corps. This is not to say that America will become militaristic in the European or Asiatic sense. Far from it. But universal military training for all boys and girls will be the order, plus the maintenance of a military machine which, for us, will be of unprecedented size.

One of the clear results of this conflict is the ultimate harmonious relations and complete accord with South America. We need what South America has and they need what we have to offer. There will, of necessity, come the time and means whereby American manufacturers can sell Latin America their goods and take South American produce in kind, as payment. That is the only reason why the United States has been beaten by Germany and England. They did, and we didn't and since the South American countries were rich in produce but not currency, they turned to the nations who would sell them needed material on the barter basis. The American dollar must become the medium of exchange for the western hemisphere, because through a unification of monetary systems the Latin American countries will benefit fully as much as we.

This is a difficult war. It is our sixth and worst war. We had no wish for its start nor its participation. But while it is going to be no church picnic, we are in it and will see it through. And seeing it through we will be doing it the American way—benefiting the world—since, by seeing it through we will be helping to destroy evil influences from the face of the earth and extending the American standard of living to those who have thus far been denied anything save serfdom. Probably our immediate domestic life will change but little. But we will have the gadgets, once luxuries and now necessities, in increasing volume of efficiency. Not only will we, the folks who make up the United States, have the refrigerators, automobiles, tires, gasoline, airplanes, phonographs, juke boxes, typewriters, electric appliances, better roads, hydroelectric projects, irrigation projects, and dust bowl control, but much and many of the things we enjoy will be spread to the other countries. Other races will live better and be healthier because of this unwanted war. I honestly believe that transportation methods will be improved; farmers will raise new crops and find new uses for old ones; and, if the war is carried to the type of conclusion most of us hope for, fear of invasion, transgression, and deprivation of human civil rights will be replaced with equal opportunity for all nations and all people with equal access to most of the basic raw materials; with American money, American ingenuity, and American labor playing the leading role in the greatest rehabilitation program the world has ever experienced.

GETTING "SOFT ... EH?

FOR VICTORY BUY UNITED STATES WAR BONDS AND STAMPS

"BEWARE of an America aroused!"

Sure we've been rolling on rubber—eating our sirloin steaks—lolling in the luxuries which only free Americans have the God-given genius to create, and the capacity to enjoy. But we can still take it, and we can still dish it out.

The world knows now that this "love of luxury" is just a thin outer garment, easily whipped off in an emergency—and that, underneath it, there are muscles of steel.

Sacrifice? We will sacrifice anything but our Liberty!

Suffering? We still remember about Valley Forge, and the blood of our fathers on the snow!

Death? Better death, any day, than life without freedom!

So they said we'd rather lose a war than lose an election? And those cracks, dividing us, were deep craters—not just surface scratches? Management wouldn't work with men, and men wouldn't work with management? And we couldn't get going *fast enough* to become a real factor in this war?

What a jolt the Axis is in for! You might just as well try to sweep the tide back with a broom as try to buck American machines, driven by free, skilled American workers.

◆ ◆ ◆

Inspired by the job our own workers are doing, we view this crisis, not with alarm—but with confidence. Every lathe, every drill, every tool in our plants has been turned into a weapon of war—every worker, man or woman, into a PRODUCTIONEER—a soldier in overalls. Such spirit, such skill, such strength cannot lose—for these men and women are fighting *with their hearts,* as well as with their heads and their hands—fighting, along with the millions of other patriotic workers throughout all America—to STAY FREE!

LINK-BELT COMPANY—INDIANAPOLIS—PHILADELPHIA—CHICAGO—ATLANTA—DALLAS—SAN FRANCISCO—CEDAR RAPIDS
THE LEADING MANUFACTURER OF EQUIPMENT FOR HANDLING MATERIALS AND TRANSMITTING POWER

Reprints in 4 colors furnished on request. Address: 307 N. Michigan Ave. Chicago.

2004A Copyright 1942 by Link-Belt Company

7,500 Days of CERTAINTY in Exacting Process Operation!

Every day for 25 years, Cleveland Fruit Juice Company has used this Foxboro Recorder to guide production!

That's what this veteran Foxboro Recorder gave to one manufacturer!

Ask the Cleveland Fruit Juice Company whether they consider it essential to keep records of processing conditions. Their own past practice gives the most conclusive answer!

Every working day for 25 years, this company has kept a continuous record of one critical process temperature. Simply through use of the Foxboro Temperature Recorder shown here, costly guesswork has been eliminated. And this veteran instrument is still in perfect calibration . . . still supplying exact production guidance every day!

No matter what part of your operation demands "close" control, its efficiency is bound to benefit from the certainty supplied by Foxboro Recorders. Automatically, you get the exact facts about each run to help you save steam, materials and costly re-runs. Uniformity can be assured.

Write for detailed bulletins on Foxboro Recorders for Temperature, Pressure, Flow or Humidity . . . recorders that give sustained accuracy without servicing. The Foxboro Company, 158 Neponset Avenue, Foxboro, Massachusetts, U.S.A. Branches in principal cities of the United States and Canada.

FOXBORO
REG. U. S. PAT. OFF.
Instruments

CORROSION TAKES NO VACATION....

BUT DURCO EQUIPMENT STAYS ON THE JOB, TOO!

The acid devils never take a rest. They constantly eat away your valuable equipment . . . equipment which today is difficult to replace and consequently is more valuable than ever. But equipment made of Durco Alloys is a match for them.

Every Durco product is *inherently* corrosion-resistant. It's the same metallurgically inside and out. It is not a lining or coating; it's uniformly wear-resistant and corrosion-resistant *all the way through.*

Among the Durco high-silicon iron and stainless steel alloys there is one that will meet your particular corrosive problem to the best advantage. Get the benefit of our specialized experience in handling corrosive solutions.

NON-CONTAMINATING

Corrosion-Resistant Durco Products *for Pulp and Paper Mills*

Pumps—Valves—Pipe and Fittings—Ejectors—Alum Dissolving Systems—Digester Fittings—Relief Valves—Tank Outlets—Strainers—Special Castings.

DURIRON

A high silicon iron, not affected by alum, for producing better paper with freedom from corrosion and contamination.

DURICHLOR

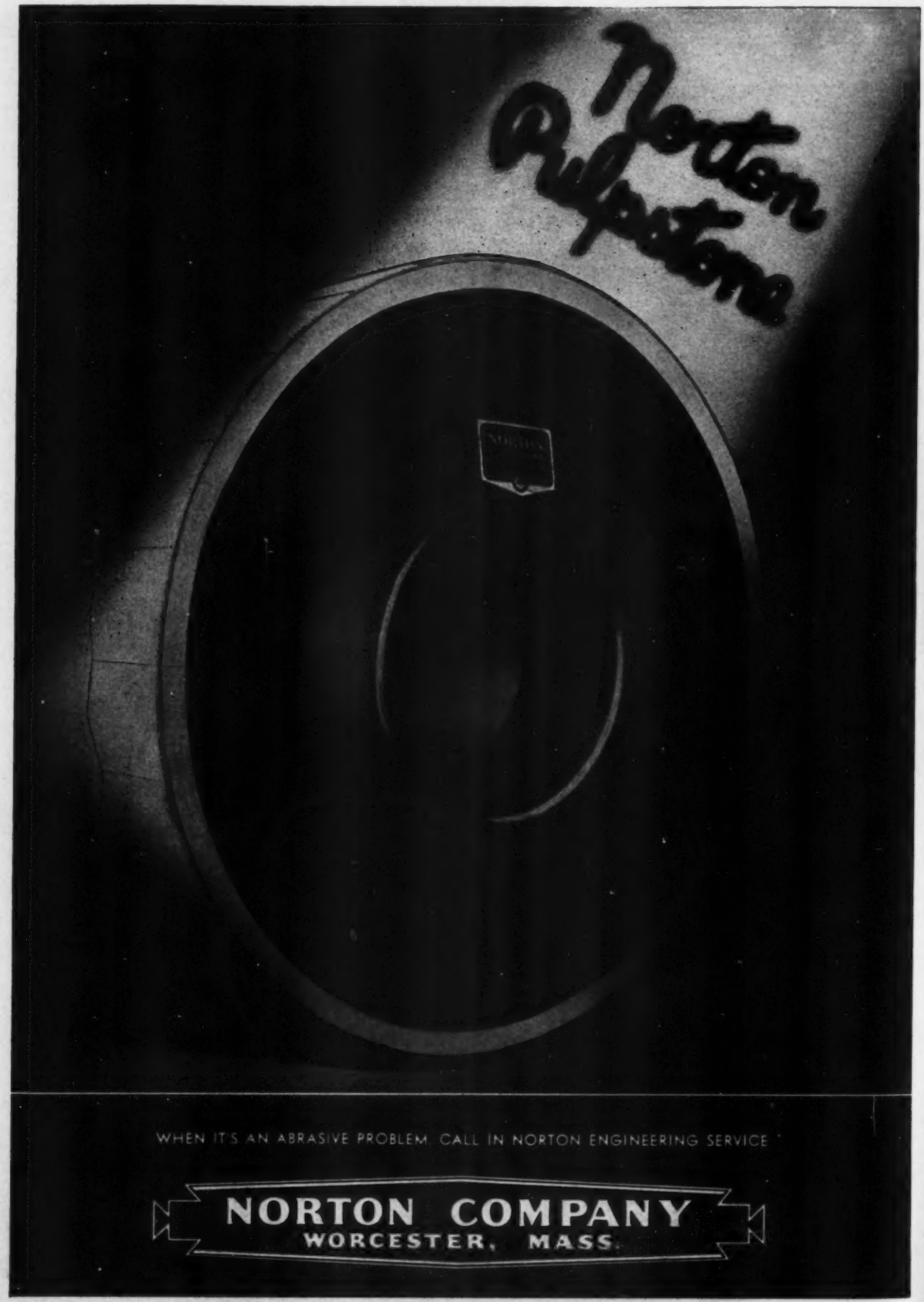
A high silicon iron, for making up and distributing bleach solutions, free from iron pick-up.

DURIMET

A low carbon stainless steel for sulfite digester fittings, sulfite circulating equipment and sulfurous acid.

THE DURIRON COMPANY, INC. DAYTON, OHIO

DURIRON · DURICHLOR · DURIMET · DURCO STAINLESS STEELS


Norton Pulpstone
WHEN IT'S AN ABRASIVE PROBLEM, CALL IN NORTON ENGINEERING SERVICE
NORTON COMPANY
WORCESTER, MASS.

Checking a complex assembly for accuracy

A pre-fabricated sub-assembly ready to slip into place

Steam AND Process lines

FOR PAPER MILLS

correctly pre-fabricated for most efficient plant operation

The pre-fabrication of sub-assemblies under controlled shop conditions makes possible compact, efficient design of steam and process lines. Pittsburgh Piping has adequate shop facilities and skilled men for work of this type. During the nearly 40 years of its existence, Pittsburgh Piping has pre-fabricated and erected piping in most of this country's large paper mills. This experience is especially valuable now, as a thorough understanding of paper mill design insures correctly pre-fabricated piping for most efficient mill operation.

Pittsburgh Piping

PITTSBURGH PIPING & EQUIPMENT CO., 10 FORTY-THIRD ST., PITTSBURGH, PA.

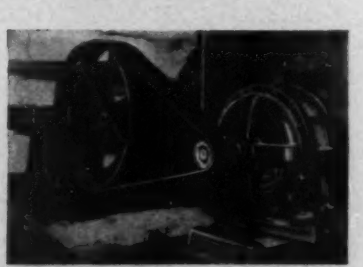
Woolworth Building, New York · Occidental Building, Indianapolis · Peoples Gas Building, Chicago · Union Guardian Building, Detroit
Public Square Building, Cleveland · 10 High Street, Boston · 525 Market Street, San Francisco

One Waterproof Research Leather Belt Will Out-Live Two Rubber Belts

More paper mills are installing Research Leather Belting because:

Research Leather Belting on pivoted motor base drive grips small pulleys without the excess flexing wear and internal friction that wears out rubber V-belts. And Research has natural overload capacity.

Research on fixed-center drives also gives longer life—reduces interruptions for belt take-up, maintains uniform speed, and delivers at least 3% more production. Cost per ton of paper is substantially less with Research than with composition belts.



Waterproof Research Leather Belting on Pump

GRATON & KNIGHT CO. Worcester, Massachusetts

Only leather belting manufacturer with complete nationwide service facilities. Distributors listed

Keep Your Monel *on the* Firing Line

R. T. BARNES, JR.
Development and Research Division
The International Nickel Co., Inc.

The purpose of this article is to help the mill operating man get maximum service from his present Monel equipment through stress on proper and adequate maintenance, and something more than usual attention to those errors and omissions which, under other circumstances, promote excessive wear or cause premature failure.

▸▸▸ PROSECUTION OF THE WAR PROGRAM makes it a patriotic duty for each of us to take the steps necessary to conserve those strategic, critical, and scarce materials so urgently needed for successful prosecution of the all-out victory effort. We are conserving on gasoline and tires, restricting uses for sugar and tin, and to be consistent most certainly should follow through by making every effort to maintain and get the most possible service from pulp and paper mill operating equipment fabricated of Monel and other vitally needed metals and alloys.

Monel is applied extensively in the pulp and paper mill because of its strength, toughness, wear and corrosion-resisting properties. The alloy can, and very frequently is, called upon to take considerable abuse in many cases where the operating man may not realize he is so doing. Inadequacies of design of course must be corrected by the design engineer and while very important in contributing to maximum service life of Monel mill equipment are only one of the important factors influencing service life. Suffice it to say that newly designed equipment should take into account all the stresses or strains to which the equipment will be subjected in service, as well as the provision for adequate metal thickness where pressure or vacuum is to be applied. In like manner, the equipment should be designed so crevices and seams which might contribute to concentration cell corrosion are eliminated wherever possible.

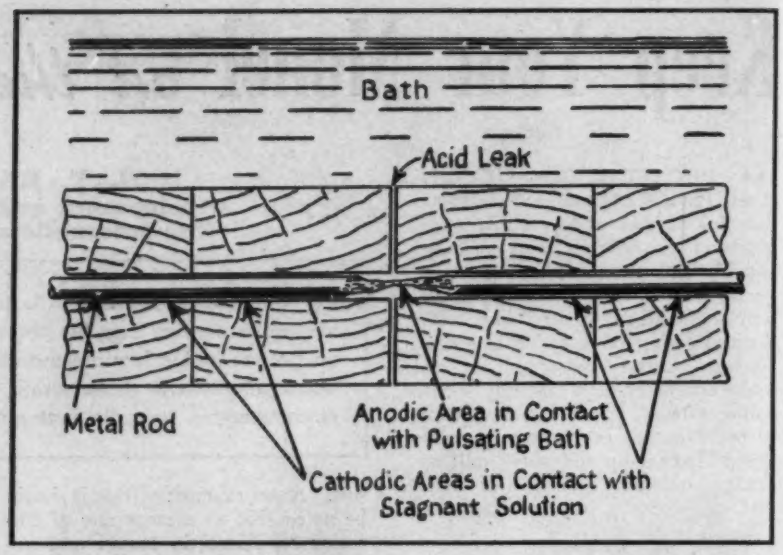
It is a recognized fact that corrosion and wear of Monel pulp and paper mill equipment may be readily controlled within very close limits, provided cleaning and maintenance operations are carried on at the correct intervals and in the proper manner. Monel wire cloth covers on stock washers and thickeners are usually cleaned with dilute sulphuric acid. The acid used for such cleaning should never be in strengths greater than 10 per cent by weight. The diluted acid for cleaning likewise should never be used at other than room temperature. Any cleaning accomplished with higher strength or warmer acid has little if any effect in reducing cleaning time or increasing efficiency, but the harm done by the use of hot or high strength sulfuric acid for cleaning purposes is considerably greater than any insignificant saving which might result. As an example of this it should be noted that an average rate of corrosion for Monel in 10 per cent sulphuric acid at room temperature is only about 0.006 inch penetration per year. In 10 per cent acid at 140 Fahr., this rate of corrosion is doubled to 0.012 inch per year, and at 203 Fahr. approaches 0.016 inch per year. Monel is corroded by 66 Bé. (concentrated) sulphuric acid at a rate of nearly 0.050 inch per year. This same full strength acid at 203 Fahr. corrodes Monel at a rate greater than 0.15 inch per year. From these figures it is evident that the use of improper strength or too hot cleaning acid will cause considerable damage to the small diameter

Cleaning acid and sours should be flushed thoroughly from all crevices and points of contact between dissimilar metals.

Monel wires on washer or thickener covers.

Many mills specify that Monel wire cloth covers and covering wires should be cleaned with hydrochloric (muriatic) acid. Where this practice is followed, the hydrochloric acid used should not be greater in concentration than 5 per cent by weight. Hydrochloric acid in strengths greater than 5 per cent, or at temperatures higher than room temperature, are actively corrosive to Monel and, as in the case of sulphuric acid, such misuse might contribute seriously to premature corrosion failure of the wires.

Monel wires, savealls, roll covers, screen plates and similar equipment may be cleaned quite readily with any of the alkaline cleaners based on caustic soda, soda ash, or tri-sodium phosphate. Since a number of prepared cleaning solutions are now on the market and are often used for cleaning paper mill equipment, it will be well before standardizing on the use of any of these to check accurately on the types and percentages of acids or alkalies which they contain. As with the sulphuric acid which is used for cleaning purposes, the prepared agents should be mixed and applied in full accordance with directions. Never clean Monel with nitric or other strongly oxidizing acids, or with chlorine solutions.



Concentration cell corrosion results from acid leaks or seepage.

Monel suction box covers and screen plates should be secured with Monel screws and bolts—never use steel or brass screws with Monel.

The corrosive action of acid or alkali on pulp and paper mill equipment, particularly in the crevices between covering wires or wire cloths and their backings, might in time promote a form of corrosion known as concentration cell attack. For this reason it is well to insist that after cleaning has been accomplished the cleaning acids or alkalies be thoroughly rinsed off before the equipment returns to service. This rinsing should be accomplished with cold, fresh water, best applied from a high-pressure hose so as to make certain that small droplets of corrosives are freed from corners, crevices and other possible lodging places. This precaution is particularly important in the case of Monel wire cloth covers over bronze or other alloy backing wires where galvanic corrosion between the two dissimilar alloys might occur if small concentrations of the corrosive cleaner are allowed to remain in contact with the two alloys. Hot water is not a satisfactory rinsing agent since, as noted previously, heating of the corrosive acid or alkali cleaners increases their corrosive characteristics.

Monel tie-rods are often used for reenforcing wooden tanks for alum dissolving or chemical storage purposes. Acid or corrosive chemical leaks through the wood are likely to promote the formation of concentration cells, in the manner illustrated by the sketch and accompanying photograph.

To guard against the danger of failures in wet wood saturated with corrosives, the exposed metal tie-rods should be given extra protection with black asphalt or other corrosion-resisting paint. The tie-rods should be drawn up securely from time to time, of course, in order to seal the wood and prevent serious leaks. Bolts and screws used to fasten Monel or other corrosion-resistant alloy linings in flow boxes or wooden tanks for any chemical use should likewise have this extra protection.

In those cases where necessity demands that dissimilar metals and alloys be used together in corrosive solutions, there are certain definite rules to follow to assure success of the combination. Where such combinations are necessary, make certain that the metals or alloys being combined both have adequate resistance to corrosion by the stock or process liquors. When it becomes necessary to combine Monel with bronze, brass, or copper, such combinations are usually quite safe, though in some instances the combination will result in corrosion of the copper or copper alloy at slightly higher than its normal rate.

Where Monel is combined with steel, the area of the Monel in relation to that of steel should be quite small since this combination otherwise is unfavorable to steel, and will promote an acceleration of the steel corrosion rate. Monel suction box covers, perforated screen plates and similar fabricated parts never should be fastened in place with brass or steel screws or bolts. The galvanic corrosion likely to result in such instances, where the Monel area is large compared with that of brass or steel, will promote rapid failure of the brass or steel. For this same reason, Monel should not be welded with any but the correct Monel welding rod since the presence of a dissimilar metal or alloy at the seams or joints might likewise promote serious galvanic corrosion.

Metal tie-rods should have paint protection against acid seepage and leakage.

At some seasons of the year, feed waters and machine waters may contain finely divided abrasive particles, such as sand and grit. Between rolls and doctors, in bearings and journals, and in pumps and valves these can and do cause excessive and irregular wear. Regular and thorough cleaning and inspection of filters will do much to overcome these sources of difficulty. The importance of proper lubrication cannot be overemphasized, and this should extend to the smallest pump equally as well as to the largest roll on the paper machine.

Strict and continued observance of the few simple maintenance rules discussed here will go far to "keep your Monel on the firing line" for a long time to come. Metals and alloys other than Monel should receive similar care, and with the exception of the cleaning solutions, their concentrations and temperatures, the same suggestions are applicable to ferrous and non-ferrous materials alike.

Did you know that

—an average chair contains enough hardwood to make the stock of a Garand rifle?

—the lumber in two average desks would provide enough material to build a trailer for a war worker?

—for every ten 30-foot cruisers that aren't being built this year our Navy can have another mosquito boat?

—the wood in one average civilian house would make two defense houses for war workers and their families?

—the beauty parlor goes to war; the iron that used to go into a single hair dryer is enough for six hand grenades?

—a single minesweeper contains enough lumber to build 20 average civilian homes and an average chair represents the wood needed for an army bunk?

—there are 30 shots at the enemy in a set of brass curtain fixtures, the metal they contain would produce that many cartridges for a soldier's rifle?

—American troops are being equipped because of that radio-phonograph Mr. and Mrs. America didn't buy this year. The steel in an average radio-phonograph would make close to a dozen bayonets?

—the largest single plant in the War Production Drive is the Newport News Shipbuilding and Drydock Company, employing 27,000 men; the smallest is the Armstrong Manufacturing Company plant at Portland, Oregon, which employs 19?

—if you find electric fans are scarce this summer, consider that the copper from a dozen such fans is enough to provide all the copper needed in fabricating a 20 mm aircraft cannon to make it hot for the Japs and Nazis?

—the steel that goes into a single sewing machine will make a high explosive shell for a 75 mm field howitzer and the steel in two large outboard motors would make a submachine gun with which our soldiers could shoot down Japs?

—one electric dry shaver will keep one man well-groomed, but the copper in a hundred electric dry shavers would make a smoketank for an airplane—a smoketank which, by throwing a screen around a fighting ship, might save many American lives?

How To Keep BELT DRIVES Running

J. R. HOPKINS, Engineering Dept.
Chicago Belting Company

▸▸▸ EVERY BELT DRIVE should have enough belt or belts to handle everything that its motor will handle—assuming the motor will provide enough power for the abnormal starting loads characteristic of some pulp and paper mill machinery.

The following belting laws (not suggestions), if made effective, would eliminate practically all belt drive trouble in either flat leather belts or V-belts.

1) Keep leather belts dressed and clean. Leather belts must be kept dressed to prevent the drying out of their fibers. They also must be kept clean. Dress with good leather belt dressing every three months for ordinary conditions—every month or every week, if need be, where air is dusty, very dry or where belts are overloaded. To clean a leather belt, wipe off dirt with waste dipped in gasoline. Let belt dry. Then dress it. Naptha or carbon tetrachloride also are good materials to use for cleaning a leather belt.

2) Make all leather belts endless. Leather belts which are endless last longer than those which are not. They also avoid fastener trouble.

3) Be sure belt thickness is correct for pulley diameters. There are minimum pulley diameters for leather belts of different thicknesses. To avoid trouble, do not use on pulley smaller than the size indicated in Table I.

4) Be sure belt is right size for load.

To have belt driven machinery work properly, it must be provided with enough continuous and dependable power to handle all peak loads, no matter how frequent or severe these peaks are. In other words, the full power of the motor or lineshaft must reach the driven machine through the belt, and enough belt must be provided for the purpose.

If any leather belt drive does not work perfectly, check the belt size. Ask any manufacturer of leather belt for the American Leather Belting Association 1939 horsepower table. Check the width and thickness of the troublesome belt with this table, and make such changes as may be necessary to comply with the table.

Short center leather belt drives are recommended only for use with an automatic belt tightening motor base (pivoted motor base used in place of motor slide rails). With this base, the leather belt is very efficient, lasting a long time; likewise, practically no drive maintenance is required.

Complete tables for checking any short center leather belt drive are presented in a *Short Center Leather Belt Drive Data Book*, copies of which are available through belt suppliers. If the recommendations of this book are followed, leather belt drives will require little maintenance and belt life will be long.

Doubling the belt speed doubles the horsepower a belt will transmit, or cuts in half the stress in the belt for the same horsepower. Be sure that motor pulley is not smaller than the diameter recommended by motor manufacturer. Nearly all unsatisfactory drives are caused by the small pulley of these drives being too small.

Automatic belt tightening motor base on 150 hp. chipper drive.

In designing a new V-belt installation, always use larger sheaves and an extra belt or two than are given in manufacturers' recommended minimums. The cost of the additional material is offset by considerably longer life. Likewise, be sure to purchase matched sets of belts so that each belt will carry its full share of the load.

In putting the belts on the sheaves, don't force or pry them over the sides of the grooves; rather slide motor forward, put the belts on, and then slide motor back to give tension. The use of a pivoted motor base under the motor makes the installation even easier and, in addition, maintains the right tension when running.

Proper alignment of sheaves is very important to V-belt life. The sheaves should be lined up in both horizontal and vertical planes. Misalignment causes the belts to scrape down on one side of the grooves as they enter the driven pulley and similarly scrape down the other side of the grooves when they enter the driver. This constant scraping action greatly reduces belt life.

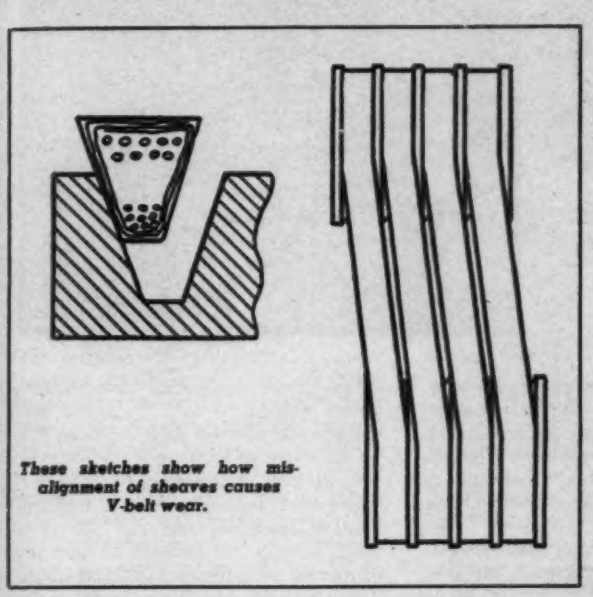
V-belts need correct tension the same as other belt drives. If no pivoted base is used, the tension in the belts should be checked 36 hours after installation has been put in service and at frequent intervals thereafter to make sure that the belts have live, springy vibration when struck by hand.

Sheave grooves should be checked to make sure they are smooth and are not worn out of shape. If they are worn out of shape, a new sheave should be installed.

A V-belt must be kept free from dirt, grease and oil. No belt dressing

is required to keep them in condition. To do so, just wipe with cloth or waste dipped in gasoline.

Never replace part of a set of V-belts with new ones. In making a replacement, replace a whole set. Save the old belts for spares to be used with other old ones.



These sketches show how misalignment of sheaves causes V-belt wear.

Table I

	SINGLE PLY		DOUBLE PLY			TRIPLE PLY	
	Med.	Heavy	Light	Med.	Heavy	Med.	Heavy
	These are the minimum recommended pulley diameters for the above thickness belts (in inches).						
Belts Under 8-in. Wide	3	5	6	8	12		
Belts 8 in. and Wider			8	10	14	24	30

Table II—Motor Manufacturer's* "Standard" Pulley Diameters for Different Motor Speeds and Horsepowers

Frame No.	3600 RPM	1800 RPM	1200 RPM	900 RPM	720 RPM	600 RPM	Standard Pulley		
							Dia.	Face	Bore
202		¾	½				3	3	¾
204	1–1½	1	¾–1	½			3	3	¾
224	2–3	1½	1½	¾	½		4	3½	1
225		2		1			4	3½	1
225	5	3	2		¾	½	4	3½	1
254				1½	1	¾	4½	4½	1⅛
254	7½	5	3	2	1–1½	¾	4½	4½	1⅛
284	10	7½	5	3	2	1½	5	4½	1¼
324	15						5	6¾	1⅜
324		10	7½	5	3	2	6	5½	1⅝
326	20						5	6¾	1⅜
326		15	10	7½	5	3	8	6¾	1⅝
364		20					9	7¾	1⅞
365			15	10			9	7¾	1⅞
365		25			7½	5	9	7¾	1⅞
404			20	15	10	7½	10	7¾	2⅛
405		30			15	10	10	7¾	2⅛
405			25	20			10	7¾	2⅛
444		40			20	15	11	9¾	2⅜
444			30	25			11	9¾	2⅜
445			40	30	25	20	11	9¾	2⅜
504			50	40	30	25	12	11	2⅝
505			60		40	30	14	13	2⅞
505				50			14	13	2⅞

(*) The National Electric Manufacturers' Association (NEMA) Standard pulley sizes. Smaller diameters that should be used with their motors for all-around good results.

Table III—Belt Speeds* in F.P.M. for Different Pulley Diameters and R.P.M.

Pulley Diam. Inches	SPEED OF PULLEY—R.P.M.							
	3450	1750	1150	850	690	575	490	435
1½	1354	687			BELT SPEED F. P. M.			
2	1805	916	602					
2½	2257	1145	753					
3	2708	1374	903	667				
3½	3160	1603	1054	779	632			
4	3611	1832	1204	890	721	602		
4½	4062	2062	1355	1001	810	677		
5	4514	2291	1505	1113	902	752	642	
5½	4965	2520	1656	1224	992	828	706	
6	5417	2749	1806	1335	1082	903	770	684
6½	5868	2978	1957	1447	1171	978	834	741
7	6319	3207	2107	1558	1261	1054	899	798
7½	6771	3436	2258	1669	1351	1129	963	855
8	7222	3665	2408	1780	1441	1204	1027	912
8½	7674	3894	2559	1892	1532	1279	1091	969
9	8125	4124	2709	2003	1622	1355	1155	1026
9½		4353	2860	2114	1715	1430	1220	1083
10		4582	3010	2225	1800	1505	1284	1140
10½		4811	3161	2337	1892	1580	1348	1197
11		5040	3311	2448	1980	1656	1412	1254
12		5498	3612	2670	2161	1806	1541	1368
12½		5727	3763	2782	2256	1881	1605	1425
13		5956	3913	2893	2342	1957	1669	1482
13½		6185	4064	3004	2435	2032	1733	1539
14		6414	4214	3115	2522	2107	1797	1596
14½		6644	4365	3227	2617	2182	1862	1653
15		6873	4515	3338	2705	2258	1926	1710
15½		7102	4666	3449	2800	2333	1990	1767
16		7331	4816	3560	2882	2409	2054	1824
16½		7560	4967	3672	2973	2484	2118	1881
17		7789	5117	3783	3062	2559	2182	1937
17½		8018	5268	3895	3158	2634	2247	1994
18			5418	4006	3240	2710	2311	2051
18½			5569	4117	3338	2785	2375	2108
19			5719	4228	3422	2860	2439	2165
19½			5870	4340	3518	2935	2503	2222
20			6020	4451	3605	3011	2568	2279
21			6321	4673	3793	3161	2696	2393
22			6622	4896	3965	3312	2824	2507
23			6923	5118	4150	3462	2953	2621
24			7224	5341	4330	3613	3081	2735

(*) Experience shows that the most satisfactory and cheapest belt drives are those with belt speeds from 3,500 to 4,500 ft. per minute. Within this speed range, narrower belts and pulleys can be used, lower bearing pressure is required, belt life is longer, and generally more satisfactory operating results are assured.

Turbine Gear Sets *For* *Paper Machine Drive*

A. J. CHURCHILL, Small Turbine Sec.
Westinghouse Electric & Manufacturing Co.

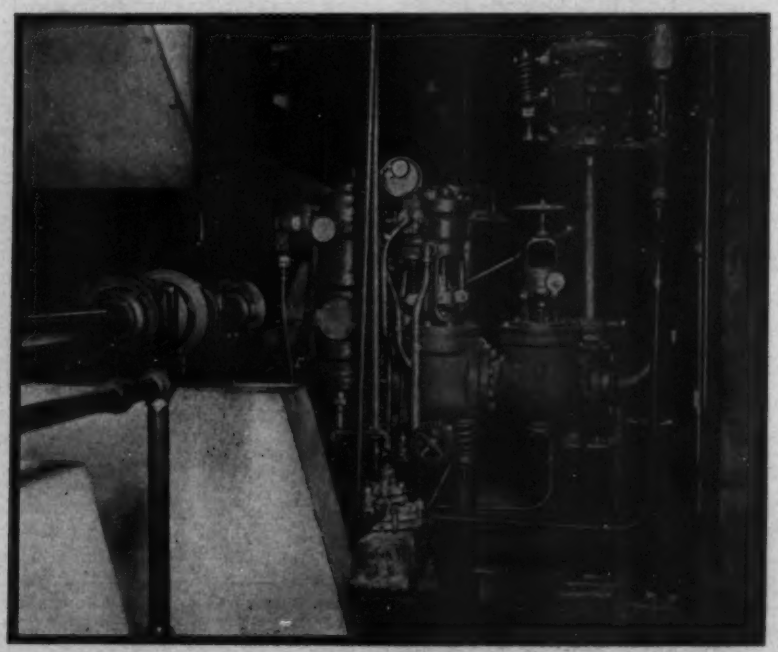
Fig. 1—150-hp. turbine gear unit installed in board mill.

▸▸▸ TURBINE-GEAR SETS for paper-machine drives are finding ever increasing favor with the cost-minded management of the modern paper mill. These compact power units have worked in well with improved plant efficiency programs of many mills and are worthy of consideration by anyone who is faced with the problem of speeding production and reducing costs. Among the many advantages which make steam turbines a logical source of power for this service are:

1) Moderate first cost
2) Wide speed range with close regulation
3) Simplicity and reliability
4) Low operating and maintenance costs
5) Oil-free exhaust steam at the pressure best suited to the plant heat balance requirements

The turbine drive unit consists of a standard turbine with special control equipment and a high-speed reduction gear mounted on a bedplate. The unit is arranged for either single-end or double-end shaft drive or with a jack-shaft and pulley for belt drive. Thus the mill receives a power unit complete with all control equipment mounted on a common bedplate and ready for any type of installation required. Complete installation of the unit can be made during a week-end shutdown and any serious interruption of production schedules is avoided.

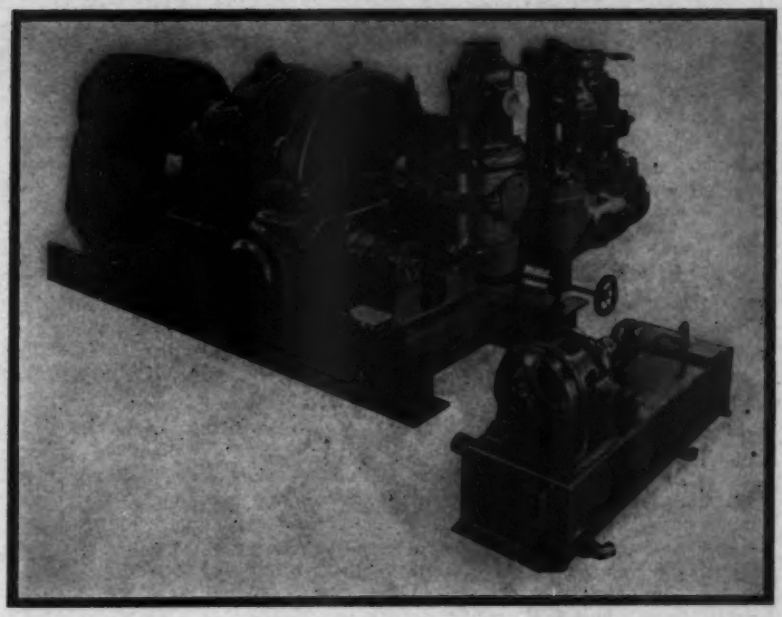
In order to select the proper turbine for a particular job, a survey of the mill's requirements should be made. Items to be considered include power, speed range, process steam demand, steam pressures and temperatures, and drive arrangement. Possible future conditions and requirements should be kept in mind and the turbine selected accordingly so that in the event of a change-over, expense will be kept at a minimum. The turbines used are taken from a standard line of machines and any one of a large number can be used to meet the particular requirements of each installation exactly. The inexpensive single-valve, single-stage turbine is well suited to the needs of the average mill and is the one most commonly used. The capacity of this turbine runs up to about 500 horsepower. Hand valves are used to improve part-load performance and take care of abnormal steam conditions. For mills having a minimum demand for process steam, the smaller flow requirements of the multivalve, multistage turbines may make them an attractive investment. Turbines of this type are also used where exceptionally high horsepower ratings are needed.



To obtain the greatest operating economy, the turbine is installed to operate on high-pressure steam from the boiler and exhaust into a low-pressure process-steam line. When installed in this manner, the turbine acts as a power producing pressure reducing valve operating in parallel with a standard reducing valve or other steam apparatus supplying low-pressure steam. By selecting a turbine having a flow requirement approximately equal to the process-steam demand, there is a minimum of power wasted by passing steam through reducing valves. The fuel cost of turbine power for this type of installation is surprisingly small. If we assume 12,000 B.t.u.'s per pound coal burned in an 80 per cent efficient boiler, the fuel cost of a horsepower-hour will be approximately 0.27 pound of coal for units producing more than 100 hp.

Fig. 2—350-hp. turbine in a book mill.

Fig. 3—175-hp. turbine and reduction gear.



Certain smaller units may have a slightly higher fuel cost.

One of the features that distinguishes the turbine drive is the speed range and close regulation that is available. The modern paper-machine governor is an especially developed control unit designed to meet the most exacting requirements of any mill. Speed ranges up to twenty-five to one, with a regulation of one-half of one per cent at any set speed within the range of the machine are available. The turbine will not only maintain constant speed within one-half of one per cent under a variable load, but will also maintain constant speed under moderate variations in steam conditions. A change in steam conditions like a change in load requires a change in flow which is automatically taken care of by movement of the governor valve. Built-in electric speed changers make it possible to set the speed from a control station located at any convenient point on the operating floor. The operator has merely to turn on the speed-changer motor control switch until the speed is brought exactly to the point desired. In cases of emergency, the machine may be shut down from the control station by pressing a button which closes the circuit on a solenoid operating a trip valve in the steam line to the turbine.

The gear is an essential part of the unit because of the relatively low speed required by the paper machine and the necessity of running the turbine at a high speed in order to obtain a satisfactory steam flow. The gear ratio is selected so that the turbine speed will be between 3,600 and 5,000 r.p.m. depending upon steam conditions, speed range, type of turbines, etc. The gears are taken from a standard line of frames developed by the turbine manufacturer for use with high speed drives. The gear wheel and pinion are designed to meet the particular requirements of each job. The gear bearings and teeth, as well as all turbine bearings, are lubricated from a central system which supplies all lubricating oil and hydraulic power for governing.

Production Planning *in a Rag Mill*

H. M. GRASSELT, Production Manager
Collins Mfg. Company

▶▶▶ TODAY, MORE THAN HERETOFORE, paper mills must adopt a rigid system of production planning in order to meet ever-changing economic conditions.

In industrial organizations, as in armies, operations of various units must be mapped out and their actions definitely determined in advance to make the whole function as an entity. By controlling operations in all phases without confusion or difficulties, it is possible to realize maximum results by completing the tasks within a certain definite time.

Difficulties in getting raw materials and process supplies in sufficient quantities must be considered. Perhaps, substitutes must be used in many instances to keep a plant operating.

Due to the tremendous demands for defense work, many items for maintenance cannot be obtained or, if so, only after a long period of waiting.

Many fine paper mills and board mills are not large enough to permit the establishing of a separate planning department. In such mills, this important work should be delegated to one member of the organization who is well acquainted with all phases of the routine. He may perform other tasks, but planning must receive his first attention.

It must be borne in mind, that the ultimate aim of planning is to produce certain plans which, when made effective, obtain maximum results within a definite period. Among the various factors pertaining to the task which must be considered, if suitable results are to be accomplished, are the following:

1) Kinds and quantities of materials required

2) Time required to obtain materials

3) Time required to prepare materials for consumption

4) Production capacity of mill equipment

5) Time required to run a given order on the paper machines and through operations, such as finishing, cutting, trimming, sealing, and packing.

6) Quantity of paper to be made

Two types of orders are common to fine paper mills or specialty mills; namely, stock orders, and customer orders.

Both types may call for same grade, color, etc.; but, for obvious reasons, should receive individual attention in planning and manufacturing.

Stock Orders

To plan for stock orders is comparatively easy. There are, however, several prerequisites to a methodical execution of all operations.

To begin with, an analysis of periodical requirements must be available. It is imperative to know whether the demand for specific grades is uniform throughout the year, or if the demand is seasonal, or whether it varies from month to month. There are, of course, no inflexible rules in regard to such demands. Even in times of peace, in normal times, industrial conditions may change over night. However, conditions can be predicted with comparative accuracy for a period of three months or more. Past records, market reports, etc., afford means to gauge these values.

Another prerequisite to planning stock orders is a record of standard manufacturing formulas for the various grades of paper made by the mill. Such standards make it possible for the purchasing department or buyer to concentrate on buying the specific grades of rags and pulp required. Since certain types of rag cuttings are seasonal, preference should be given to grades that can be had the year around, or to closely related grades which could be alternated if and when necessary.

If a mill buys definite standard grades, best suited to its respective types of paper, processing operations will be simplified and the quality of the product kept uniform.

To stabilize the cost of furnishes and to assist the cost department in its work, the purchasing department should establish a budget for a period of three months or more. A budget of this kind will enable the buyer to arrange his buying activities accordingly.

Rag qualities as well as rag prices must be in line with the respective grade of paper to be made. While skill in preparing half stuff and in properly treating the stock in the beaters (assuming that the condition of the equipment is satisfactory) has a definite bearing on the quality of the product, the raw material itself must have certain qualities in order to meet specifications. No matter how skilled a superintendent or beater engineer, a 100 per cent rag sheet, with a required Mullen of 5 points to a pound and 3,000 double foldings cannot be made out of Old Whites or Prints.

Some sort of a drainer inventory record is necessary if a sufficient quantity of uniformly seasoned half stuff is to be kept on hand. Half stuff seasoned from ten to fourteen days permits better beater operation with resultant higher paper quality. In addition, such half stuff can be furnished in more uniform weight to the beaters than can material that is dug after having been dumped for only a few hours.

Cost accountants know that it is rather difficult at best to balance drainer inventories. If the percentage of rags that goes into a rag content paper is too high, it means higher manufacturing costs; if too low, complaints from consumers.

The co-ordination of stock order requirements and half stuff preparation present one important step in satisfactory and economical paper machine operation.

Customer Orders

In planning customer orders, special attention must be paid to specifications and to specific raw materials to be used if the grades are different from stock orders or if there are certain requirements that ordinarily are not needed for standard grades. Otherwise the planning for one type of order is the same as for the other.

Manufacturers may not always be able to maintain quality and specifications during the present war period because of the scarcity of certain supplies and chemicals (chlorine, for instance), but an effort must be made at all times to obtain the best results possible under prevailing conditions. It certainly is not true, that "anything will do" right now. The manufacturer who keeps up his quality will retain the good will of his customers. He also will prevent his employees from getting careless, a habit once acquired which would be hard to break.

Running Schedule

With adequate quantities of raw materials and supplies provided for, the mill can proceed to schedule its runs. To do so, it is advisable to have a printed form made out for each week, carbon copies being given to the sales department, order department, finishing room, and, of course, to the manufacturing department.

The form should contain order numbers (customer and mill), name of customer, grade, size, weight, substance number, color and quality to be run, also day to be made and the promised shipping date. It is advisable to leave twenty-four hours open for any special request or rush order that may come up during a current week.

For economical and efficient operation, it is necessary to group colors, sizes and weights. Thus, the paper machines can be operated with a minimum of delays for washing up, change of deckle, weights, etc.

Each of the various departments having a copy of the schedule, and knowing what paper must be made during the week, can do its planning accordingly.

Promises

The order department must follow up the flow of operations and see to it that customer promises are kept. To do this job, it should have some sort of a follow-up system in addition to its copy of the running schedule. A card system with guides for each day of the month will do very nicely.

Any promises should be entered under the respective customer's name and filed to turn up a day or two before the promise becomes due. If, for instance, an order is to be shipped on the tenth of the month, the card with this date should come up on the eighth. On the later day, the order department should ascertain if the paper will be ready as promised. If for some unforeseen reason, shipment will be delayed, the customer can be informed at once and then given a new promise. Needless to say, the new promise must be kept under any circumstances.

A customer will be disappointed by the notification that his order will be delayed, shipped on a later day. However, his disappointment will be allayed to a certain degree by receiving such information before shipment is due. He, at least, has the satisfaction of knowing that his order has not been forgotten.

Government and Civilian Orders

Every manufacturer, dealer and consumer realizes, that the war has to be won at any cost; and is more than willing to make sacrifices. Government orders have to receive preference over all other business. Nevertheless, contacts with civilian customers must be maintained and the effort made to retain their good will under most trying conditions.

Good planning is instrumental in keeping government and civilian orders and shipments well-balanced. Thus, it is doing its part in winning the war as well as retaining the good will of old and loyal friends and customers.

Core Waste Nomograph

D. S. DAVIS
Wayne University

▶▶▶ IN CONNECTION WITH combating losses from various converting operations it is frequently necessary to determine waste due to paper left upon cores. This can be done by stripping the waste paper from the core and weighing it but an entirely satisfactory estimate may be made by calculating the weight from the measured depth of paper on the core or, if greater precision is desired, from the measured circumference of the nearly depleted roll.

Derivation of Equation

With reference to the inserted figure on the chart let
A — distance, core to edge of roll, inches
r — radius of core, inches
L — unwound length of paper, feet
c — average caliper, inches

Equating expressions for the area of paper in an end view of the roll and the area of the edge when unwound,

$$\pi [(A + r)^2 - r^2] = 12\ L\ c$$

$$\pi\ A\ (A + 2\,r)$$

from which $L = \dfrac{}{12\ c}$

When b — width of roll, inches
R — basis weight, pounds, 25″ × 38″, 500
M — weight of roll, pounds

$$L = \frac{M\ (25)\ (38)\ (500)\ (12)}{R \qquad (144) \qquad b}$$

from which (Equation 1)

$$M = \frac{6.614\ R\ b\ A\ (A + 5.575)}{c} \times 10^{-6}$$

where 2 r — the core diameter — 5.575 in.
Let P — the circumference of the nearly depleted roll
Let p — the circumference of the core of diameter, d.

Then $2\,A + d = P/\pi$

from which $A = \dfrac{P/\pi - d}{2} = \dfrac{P}{2\pi} - \dfrac{d}{2}$

$$A + d = \frac{P}{2\pi} + \frac{d}{2}$$

(Equation 2)

$$A(A + d) = \left(\frac{P}{2\pi} - \frac{d}{2}\right)\left(\frac{P}{2\pi} + \frac{d}{2}\right) = \frac{P^2 - p^2}{4\pi^2}$$

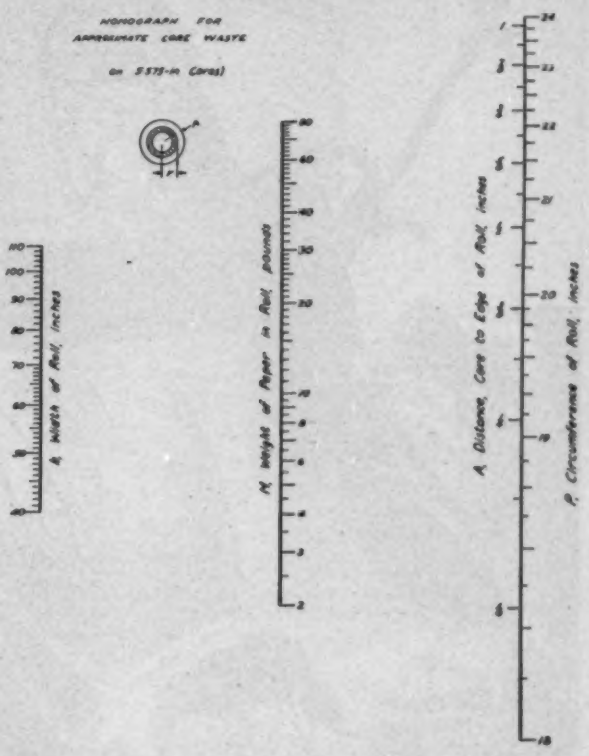
The ratio R/c is fairly constant for a given grade of paper and may be taken as 14,960. When this value and Equation 2 are substituted in Equation 1 there results

$$M = \frac{b}{4}(P^2 - 306.95) \times 10^{-2} = 0.0989\ b\ A\ (A + 5.575)$$

For cores other than 5.575 inches in diameter and paper for which R/c is not 14,960 suitable adjustment of the equation must be made.

Use of the Nomograph

The equation is readily solved by the nomograph the use of which is illustrated as follows: What is the waste for an 81-inch roll when ¾ inch of paper is left on the core? Connect 81 on the b scale with ¾ on the A scale and read the core waste on the M scale as 38 pounds. What is the waste


NOMOGRAPH FOR
APPROXIMATE CORE WASTE
on 5.575-in Cores
b Width of Roll, inches
M Weight of Paper in Roll, pounds
A Distance, Core to Edge of Roll, inches
P Circumference of Roll, inches

for a 102-inch roll when the circumference of the nearly depleted roll is 22.5 inches? Connect 102 on the b scale with 22.5 on the P scale and read the core waste as 51 pounds on the M scale.

The Waste Tape Method

For rolls of the same width the amount of core waste may be estimated very quickly by using a specially graduated metal or cloth tape reading in pounds directly. Thus, for 100-inch rolls,

$$M = \frac{P^2 - 306.95}{4}$$

and the circumference for any given weight may be calculated by the equation

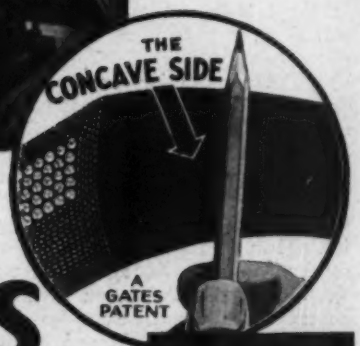
$$P = \sqrt{4\,M + 306.95}$$

Such values are tabulated below:

M—lb.	P—in.	M—lb.	P—in.	M—lb.	P—in.
4	17.97	18	19.47	44	21.97
6	18.19	20	19.67	48	22.35
8	18.42	24	20.07	52	22.70
10	18.63	28	20.47	56	23.05
12	18.85	32	20.85	60	23.39
14	19.05	36	20.24	64	23.73
16	19.26	40	21.61	68	24.06

PAPER SKETCHES

PAPER TUBES
LOADED WITH EXPLOSIVES AND PELLETS WERE USED IN WAR AS PRIMITIVE GUNS BY THE ANCIENT CHINESE. THESE WERE FIRED VERY MUCH LIKE THE MODERN ROMAN CANDLE.
STIFFLY STARCHED PAPER COLLARS WHICH STOOD UP ON BOTH SIDES OF THE FACE WERE POPULAR ABOUT 1812.
PENSILVANIA
WR
THE CLOVERLEAF DESIGN USED BY RITTENHOUSE AS A WATERMARK FOR HIS PAPER, WAS THE COMMON SEAL OF GERMANTOWN.
A RESILIENT PACKING MATERIAL MADE BY EXPANDING KRAFT PAPER INTO A HONEYCOMB PATTERN, THROUGH THE USE OF AN EXCLUSIVE PROCESS, IS ONE OF THE RECENTLY ANNOUNCED PAPER PRODUCTS.



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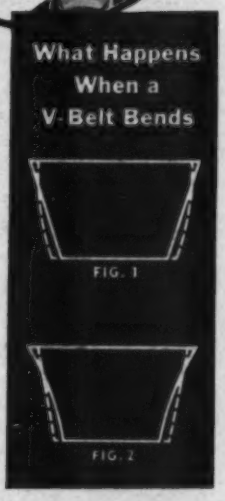
is SAVING BELTS
for *Industry*. . . and Rubber for the *Nation*

To see for yourself the belt-saving importance of the CONCAVE SIDE, just pick up *any* V-belt and bend it as it bends when it goes around a pulley.

As the belt bends, grip its sidewalls firmly with your fingers as in the photograph above. You will feel the sides of the belt *change shape*. If the sides were straight before bending, they will *bulge outward* as the belt bends. (See Figure 1 on the right).

Now look at Figure 2. Here you see how bending changes the shape of a belt that is built with the patented Concave Side. The side becomes perfectly *straight*. This belt, when bent, precisely fits its sheave groove. Here are the savings:—(1) There is no side-bulge. This means *uniform* wear—*longer* life—a saving in belts for you, a saving in rubber for the Nation. (2) The full side-width of the belt uniformly *grips* the sheave groove wall—carries heavier loads without slippage—another saving of belts and a saving in power, too!

Only belts built by Gates are built with the Concave Side, a Gates patent.



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SUPERINTENDENTS

Convene in Wartime Meeting

▶▶▶ THE SESSIONS OF the twenty-third annual convention of the American Pulp and Paper Mill Superintendents Association, held on June 16, 17, and 18, 1942, in Hotel Pantlind, Grand Rapids, Michigan, were definitely of a wartime character. The very atmosphere of each of the various meetings was as if electrified by the emergency. If everything that had transpired during the convention could be epitomized in a single thought, it probably would be—*the paper industry has a definite job to do in the winning of the war, and it will do it.*

▶▶▶ The convention was called to order shortly after ten o'clock on the morning of the first day by Oscar Stamets, president of the Association. Invocation was pronounced by the Reverend Earl F. Collins of the South Congregational Church of Grand Rapids. Then, in a brief "In Memoriam" service, Robert L. Eminger, secretary-treasurer of the Association, read the names of the members who had passed on since the Poland Spring convention of a year ago, and following the reading, the Rev. Collins offered a memorial prayer.

The names of the members for whom the memorial service was held were: Ross Auvil, Henry Bert, A. W. Bronk, Charles E. Conley, Walter B. Hadley, J. W. Harbrecht, Peter J. Maasbyll, Lester S. McCurdy, J. W. Outerson, Fritz L. Straus, F. J. Timmerman (president of the Association in 1936-37), and H. T. Waters.

The President's Message

Following the memorial service, Mr. Stamets presented the President's Message for 1942. In this message, he related that the past year, although a trying one, was met fearlessly and without falter, and that the activities of the Association have been conducted in such a manner as to be felt in the national and international plan of world affairs.

"Our industries have undergone changes that perhaps never have been known before; demands have been made upon us which call for added effort and ability; uncertainty has beset us but has been dismissed; even the holding of this convention was in the balance at times, but we have risen above all obstacles and will continue to do so if we work together," said Mr. Stamets.

Continuing his remarks, Mr. Stamets made specific reference to the excellent work of the secretary-treasurer, "Bob" Eminger; and to the equally fine work of the field secretary, George Craigie. He pointed with pride to the *Paper Mill News*, official organ of the Association; and thanked the American Paper and Pulp Association, the Technical Association of the Pulp and Paper Industry, and the Salesmen's Association of the Paper Industry for their courtesies during the past year. Gracious appreciation likewise was expressed to the Allied Industrial Affiliates for the manner in which they have strengthened the Association.

GROVER KEETH
Newly elected president of the American Pulp and Paper Mill Superintendents Association.

In concluding his message, Mr. Stamets, in talking directly to his fellow members, said, "My gratitude and thanks to you are exceeded only by my fondest wish that the coming year brings to a victorious ending the strife and confusion which exists in the world today. And as our Nation emerges from the conflict victorious, may the light of our Association shine brighter than before because we have chosen to stand together and work for a common goal."

Appointment of Committees

The following committees were appointed by Mr. Stamets during the opening session with the order to report at the business session on the afternoon of the third and last day of the convention:

Auditing—Grover Keeth, S. G. Blankinship, Ray Barton.

Resolutions—K. E. Terry, Harry E. Weston, Arnold J. Barea.

Nominating—W. H. Brydges, Charles Champion, H. Nendorf, Ray Zellers, Walter Johnson.

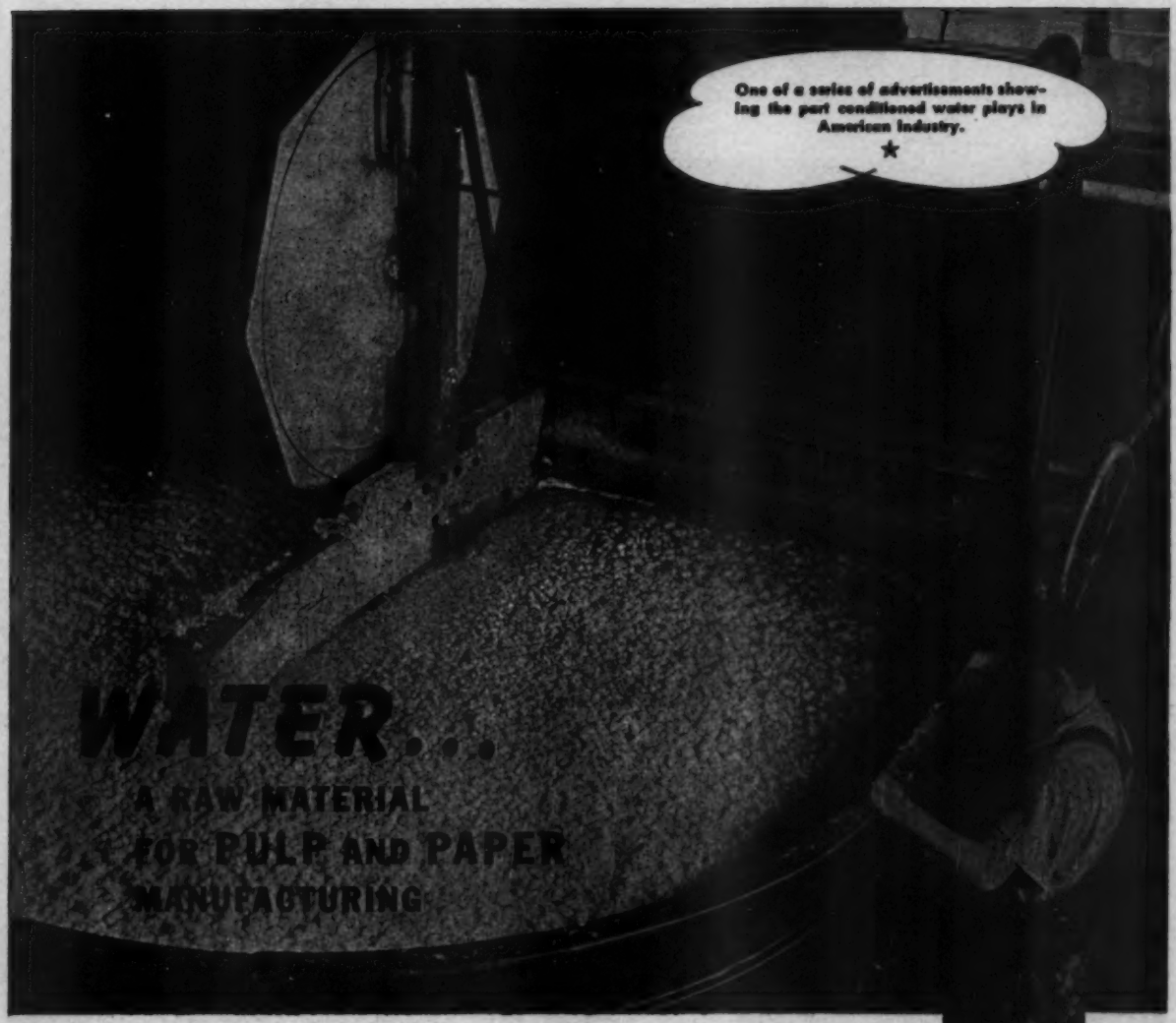
Three addresses completed the program of the first morning of the convention, the first by Ralph A. Hayward, president and general manager of Kalamazoo Vegetable Parchment Company, Parchment, Michigan, on *Importance of Pursuing Program of Conservation of Critical Materials and Some Methods of Procedure for Same;* the second by E. W. Tinker, executive secretary, American Paper and Pulp Association, New York City, on *The Paper Industry and the War;* and the third by A. G. Amos, staff member, American Paper and Pulp Association, New York City, on *Priorities as Affecting the Paper Industry.*

Mr. Hayward Speaks

Courageous leadership and the conservation of manpower came in for serious consideration by Mr. Hayward. People, he said, want to do things—want to make sacrifices. "There never was a time when the spirit of a mill organization was as important as now," commented Mr. Hayward. He then stressed the fact that each mill organization needed the support of every man, woman and child connected with it—that confidence and loyalty of employes had been slipping away.

The starting place of a conservation program, in the opinion of Mr. Hayward, is that of building employe morale. He related that some employes do not feel they are doing as important a job in making paper as they would if they were making tanks, or other equipment of war. To meet this situation, he suggested that the value of the printed word going to people should be emphasized.

After speaking briefly upon the need for ingenuity and resourcefulness in maintaining qualities of papers and,


One of a series of advertisements showing the part conditioned water plays in American industry.
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A RAW MATERIAL
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Water is a raw material of prime importance in pulp and paper manufacturing. This billion dollar industry is one of the largest industrial users of water. For every pound of paper produced, over one hundred pounds of water are required. The annual production of twenty million tons calls for approximately 1,000,000,000 gallons of water *every day*—enough to fill a lake a mile across to a depth of ten feet.

To the paper industry and to all other industries using water in quantity Betz renders a complete service of consultation, research, design and supervision...for process water, boiler water, waste and sewage disposal. Within this one organization lies the solution to all your water problems.

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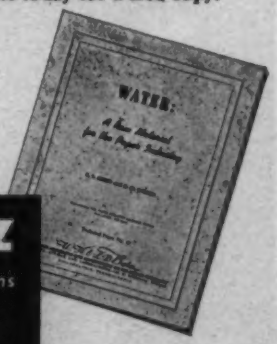
"Water...A Raw Material for the Pulp and Paper Industry" is a technical paper by Betz engineers covering both process and boiler feed water for pulp and paper mills. Write today for a free copy.



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in some cases, even in improving them, he complimented the pulp industry for the job it has done.

Mr. Hayward then mentioned that men are needed for the armed forces and for war production work; that the call for men during the next six to eight months will be tremendous; and that the industry must adjust its program to meet these changing conditions—possibly substituting women for men on some jobs, and rearranging jobs so that older men, or men too young for war service, can fill them.

Citing the fact that some mills are not operating on a full-time basis, Mr. Hayward said that it is the responsibility of management to give a full week of work—that men who cannot be employed full time should be encouraged to get other jobs.

Mr. Hayward also called attention to the problem of teaching new men and new women; and said that the mills should be barraged with literature to carry on an intensified safety campaign. He urged each individual present at the meeting to help in promoting the safety program, commenting that accident risks are going to increase substantially.

Mr. Hayward urged that heat, light and power be conserved in every plant in the country; that cars and trucks be loaded to capacity, and that there be a fast turnover of rolling stock; that automobiles be conserved; and that employes buy War Bonds. He also said that a well-operated salvage program is necessary; that the use of machine tools on direct war effort is a worthy project for the mechanical department of every mill; and that ideas of ways and means to conserve materials should be obtained from employes on the job.

The salvage program in operation at KVP, said Mr. Hayward, has been a development of the last fifteen years.

Paper and the War

Mr. Tinker, early in his remarks on *The Paper Industry and the War*, said: "It can be stated without apology or equivocation that the pulp and paper industry has done its utmost to contribute the maximum on behalf of the successful prosecution of the war."

"Different companies producing pulp," continued Mr. Tinker, "were among the first to be asked by Mr. Leon Henderson's office to not advance prices beyond those in existence at a certain date. This request was gladly met and has since been complied with."

Among other interesting comments by Mr. Tinker were the following:

"Early in the days of the National Defense Program tremendous pressure was brought upon the industry to expand production to the utmost and production was stepped up to record proportions in response to this pressure from Defense agencies even though the overtime payments required to maintain such production might adversely affect the profit situation of individual companies.

"The industry was asked by the Office of Production Management to curtail its use of chlorine and to develop an orderly process in doing so. In co-operation with the proper governmental agencies, this was accomplished and presumably facilitated the operations of the chlorine producers, as well as the maintenance of necessary war supplies.

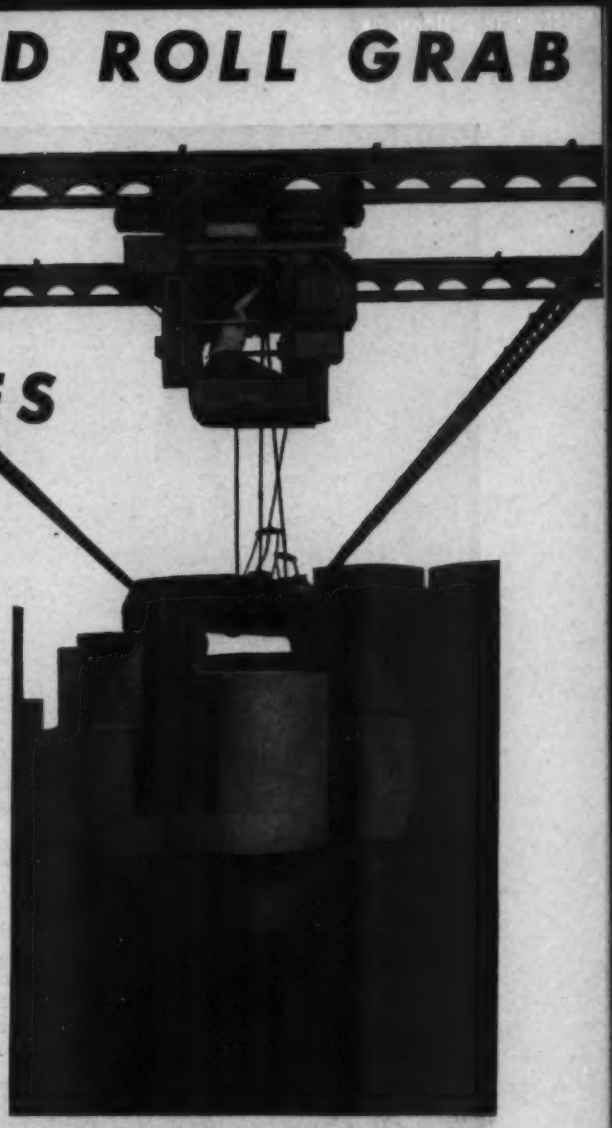
"Over-all machine shop facilities of the pulp and paper industry have, where feasible, been dedicated to the production of war material and every effort is being made to expand this use where it will effectively contribute to production.

The Industrial Affiliates of the Superintendents Association held a dinner on Monday evening, preceding the first day of the convention.

NEW MOTORIZED ROLL GRAB

has

NOVEL FEATURES

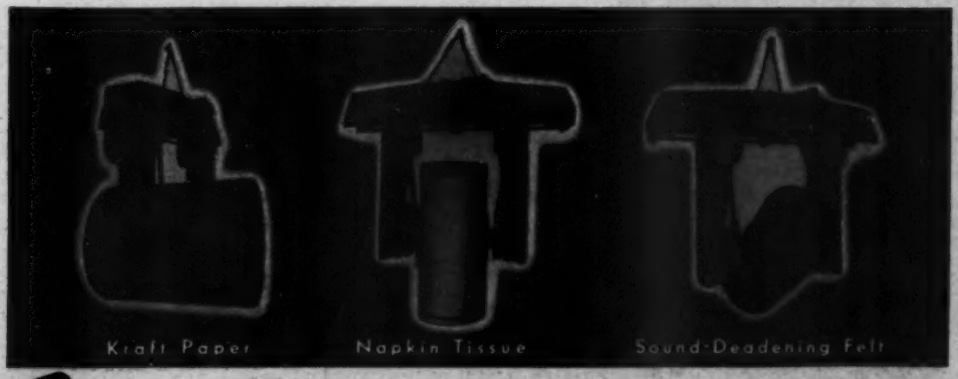


The new Cleveland Tramrail roll grab handles rolls from 16-inch minimum to 60-inch maximum diameter in lengths up to 72 inches and weighing up to 5,000 pounds.

All motions are motorized, and are controlled from the crane operator's cab. Three motors are provided. One motor spreads and retracts the grab arms. Another squeezes the roll grippers after they have been brought close to the roll, and thus securely locks the roll in position and prevents any possibility of slipping away and falling in transit. The third motor operates the turn-over mechanism which makes it possible to pick up a roll in any position and place it in any other position. Thus a roll piled vertically can be picked up and placed in a horizontal position.

When a roll in the vertical position is to be picked up and delivered in a horizontal position, or vice versa, the turn-over mechanism can be operated while the crane is in motion, thus saving time that ordinarily would be consumed for this operation.

The grab is suitable for the handling of all grades and thicknesses of paper, from light crepe and tissue paper, sound-deadening felt to kraft and hard box-board. It is sold for use on Cleveland Tramrail only.



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OVERHEAD MATERIALS HANDLING EQUIPMENT

The Board of Trustees of the American Pulp and Paper Mill Superintendents Association held its annual meeting at the Pantlind Hotel, Grand Rapids, Michigan, the day before the convention opened.

"The Executive Committee and Board of Governors of the American Paper and Pulp Association, as a matter of policy, have directed that every possible step be taken in the interest of co-operating with war agencies. They have further directed that the Association do everything that it can within the industry to assist the war program. Currently, six different committees are actively functioning and spending many hours and days of labor in the interest of rendering every possible assistance.

Five paper mill representatives exchange ideas following one of the sessions. (L to R) Standing—A. J. Barea, Patterson Parchment Co.; E. F. Otto, Consolidated Water Power and Paper Co.; S. R. Turner, Central Paper Co. Seated—Fred Hodgemire, Hawthorne Paper Co.; and G. H. Rice, Kalamazoo Vegetable Parchment Co.

"The Traffic Committee of the Association maintains current contact with the Office of Defense Transportation and all other war agencies dealing with the transportation problem.

"The Pulpwood Committee of the American Paper and Pulp Association, operating conjunctively with the American Pulpwood Association, is currently developing factual data with respect to the pulpwood supply situation and factors affecting the supply, that it is hoped and expected will be of value to war agencies and to the industry itself.

"The Paper Supply and Consumer Rationing Committee, with its knowledge of current conditions and the over-all statistical background, has given and will in the future, through the benefit of its judgment and knowledge of current trends, furnish advisory information to the industry, and we hope to governmental war agencies."

Mr. Tinker cited the activities of the Industrial Relations Committee, mentioning that it develops information with respect to employment trends, and the economical use of manpower in times of stress, as well as training programs, essential, if the industry is to continue to operate under conditions involving the draining off of considerable percentages of its skilled labor.

"The same committee that developed the *Dictionary of Paper*," remarked Mr. Tinker, "has undertaken

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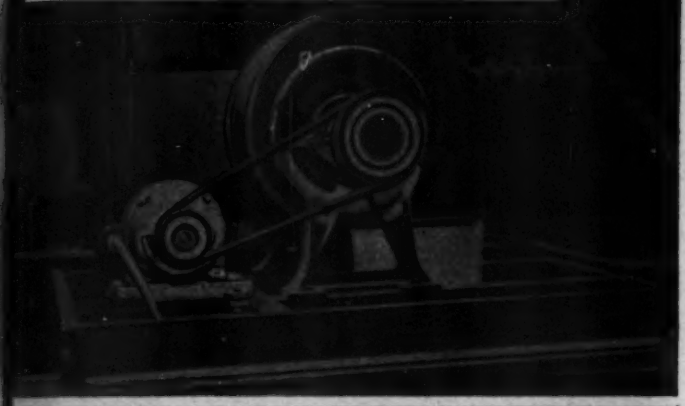
Settling dust gets nowhere with this Tri-Clad motor—driving a blower. Its sleeve-bearings are sealed against dust and dirt by complete enclosure in cast iron.



Note how the cap screws are arranged on a 45-degree angle with the vertical for easy accessibility and to allow the end shields to be easily turned to the most desirable position.

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Tri-Clad motors are now available up to 100 hp in standard, open construction, and in a wide range of other types and ratings. Ask your G-E representative for complete details, or write General Electric, Schenectady, N.Y.

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TRI-CLAD MOTORS

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MANY fans and blowers must be installed high above the factory floor, or in awkward locations where working space is limited. Here's where the Tri-Clad motor becomes a real time-saving aid to hard-pressed installation crews hurrying to get vital equipment into production.

Tri-Clad motors are a cinch to install because of their light weight and compactness. Also, their shape facilitates ease of handling, by hand or with slings. Four-position end shields permit flexibility in mounting, and the roomy four-position conduit box affords unrestricted working space. All leads are permanently identified. In addition, Tri-Clad features facilitate lubrication and other routine maintenance.

Specify Tri-Clad motors on your next order. You, too, will find that they save precious man-hours when you're installing equipment essential to the war program.

BUILT FOR PROTECTION FIRST . . . TO LAST!

General Electric and its employees are proud of the Navy award of Excellence made to its Erie Works for the manufacture of naval ordnance.

Here again, light weight and convenience in mounting and lubrication are important advantages of this Tri-Clad motor driving an exhaust fan.

GENERAL ELECTRIC

and nearly completed the job of classification of paper on the basis of use.

"The Association's Committee on the Conservation of Critical Materials, co-operating with TAPPI and your Association, has developed, on the basis of the best knowledge within the industry," said Mr. Tinker, "rules and practices that will result in maximum conservation in the use of materials needed for war purposes and these results will be made available to the industry in the form of printed pamphlets which, if followed in practice, will assure maximum conservation at this time and maximum economy in future times."

Priorities

Mr. Amos, in his address on *Priorities and the Paper Mill Superintendent*, commented, in part, as follows:

"We have watched for over a year the parade of priorities. We have seen orders in the *L* Series, *M* orders, *P* orders, Price Schedules and *E* orders. We have tried to assist in the clarification of those that affect the paper industry so that the going will be a little easier on those of you who after all must live with them.

"The paper industry has developed many ways of conserving critical materials and a Conservation Committee of that industry is now publishing a series of some fifty articles on specific methods on conservation of materials. These articles cover subjects on nearly every scarce material now used by the industry. There are, no doubt, a number of orders yet to come and it presents a definite challenge to everyone to assist in working out concrete methods of conservation.

"I presume you are interested in where we are going so far as priorities and allocations are concerned. I wish I could tell you. I don't believe even official Washington would care to predict since so many factors and 'ifs' are involved.

"There is probably not much question that some materials will be more difficult to obtain although new and better means are in the offing which will give a better picture of supply and demand. Unfortunately, mistakes have been made in estimating needs and production capacity in some industries—the paper industry being a case in point.

"We understand that applications for priorities processed by the Pulp and Paper Branch have almost doubled since January. This is probably due to the fact that the *A-10* under *P-100* is becoming inadequate due to shortages of materials, or the desire to build up inventories, or a desire to expand.

"According to their policy, just announced, the Pulp and Paper Branch will deny requests for priorities for materials that are to be used for expansion of facilities unless such expansion is requested by the War Production Board. It will likewise deny requests for improvements even though this makes for a loss in production.

"So far as maintenance and repairs are concerned, assistance will be available only for the minimum requirements. Substitutes must be used and will not be deemed impracticable even though they are uneconomical or inefficient.

"In case of emergency, where a breakdown will cause partial or complete shutdown, priorities will be available if a given mill will report by telegram the essential details.

"Application for ratings will only be approved in any case when it is apparent that the applicant has explored the possibility of substitute materials and has selected the least critical material for the purpose at hand. Policies will be liberal under Order *L-83* in granting release of second-hand material.

"It has been announced many times that it will be necessary for all industries to come under some form of a Production Requirements Plan in order to get supplies after July 1. The theory back of this is sound since it is necessary to know the quantity of materials that are needed as well as what materials are available.

"Priorities Regulation No. 10 or the so-called Allocation System recently issued will do two things—or at least there are two purposes in mind. One is to obtain standardization and reduce the rules of different forms for allocation purposes that the industry must now submit to the War Production Board; and two, to furnish information needed by the War Production Board in the allocations of materials.

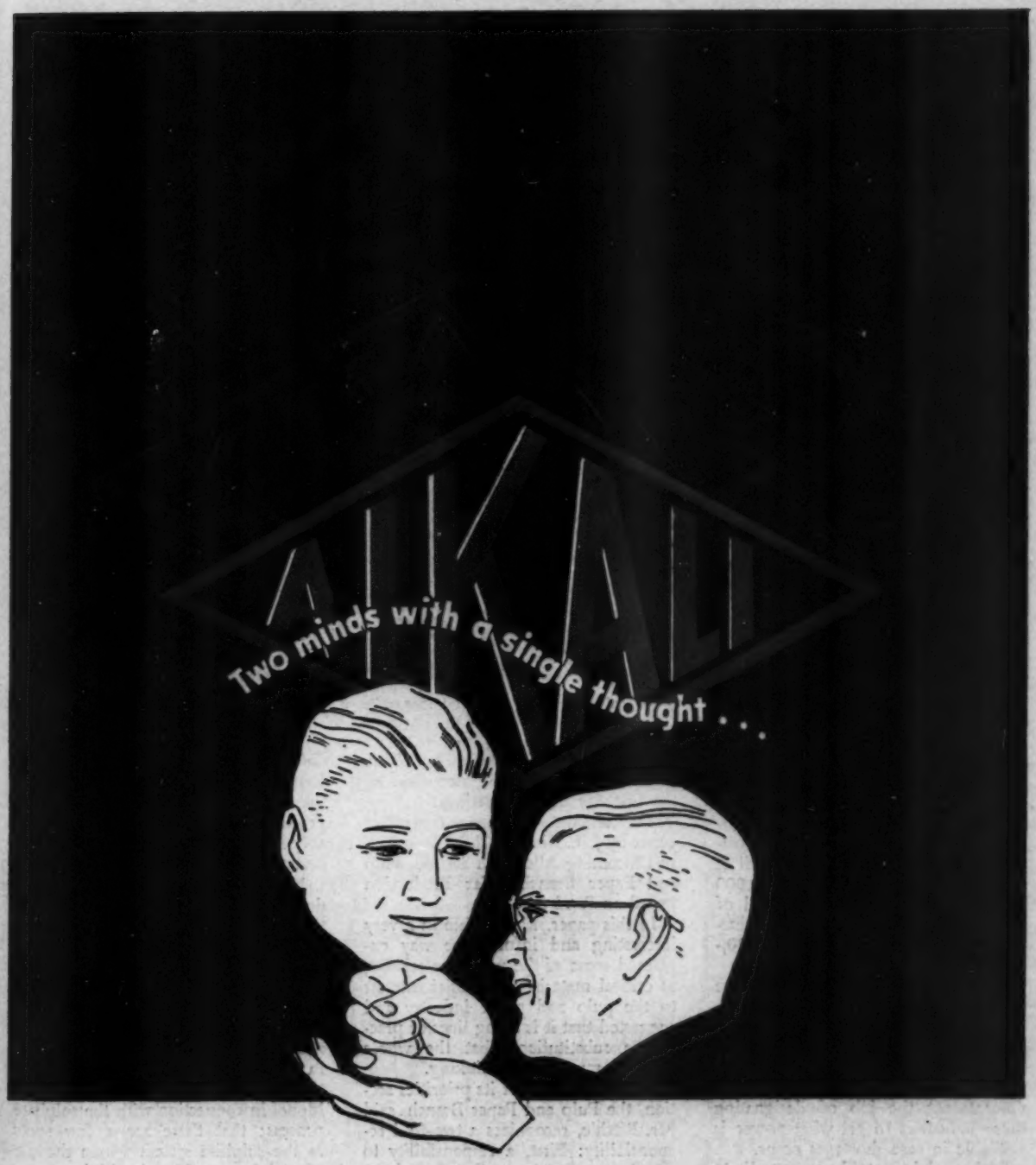
"There is probably no question now as to the ability of paper mills to produce adequate supplies of paper, providing raw materials, such as pulp are forthcoming. There is no question as to the supply of wood for pulping purposes. There is, however, some question at the moment as to woods labor and adequate transportation to get this wood to the mills. Here again rubber plays an important part since a larger per cent of wood is annually transported from the forests by trucks.

"It is not inconceivable that a priority will be placed on labor and in war industry areas the bid for manpower will become pronounced. It does behoove mill superintendents and personnel officers of the plants to study their situation and know where they are going in connection with the labor market.

"Regimentation of workers by the Government is a possibility.

"It is not beyond the realm of possibilities to see various factories in agricultural areas closed down during the harvest periods this fall, espe-

A friendly group taking a few minutes of relaxation. (L to R) Standing—E. Stern and J. W. McClaran, National Starch Co.; A. B. Perlick, Kalamazoo Vegetable Parchment Co. Seated—L. H. La Liberti, Kalamazoo Vegetable Parchment Co.; and S. V. Cottrell, National Aniline Div. Allied Chemical & Dye Corp.



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PAPER MILL PRODUCTION AND PURCHASING EXECUTIVES ARE IN PERFECT AGREEMENT ON THIS SOUND SPECIFICATION FOR OVER 25 YEARS—

DIAMOND ALKALI COMPANY, PITTSBURGH, PA. *and Everywhere*

The Maintenance and Conservation Forum was well planned, and being an innovation it proved to be an interesting and valuable presentation.

cially if those factories are engaged in producing civilian goods or non-military products.

"The manpower commission estimates that at least 9,000,000 were employed in war industry as of April 1, but it goes on to say that 17,000,000 must be so employed by the end of 1942 and that maximum war production during 1943 may require 20,000,000 or more.

"The superintendent's problems are not over even if he gets over the hurdles of materials and labor. He still may have a power problem confronting him since the machinery is all set up under Order *L-94* which gives the Government the job of designating those industries to get what power is available in case shortages occur.

"I hope I have told you enough to spur you to further effort to conserve critical materials and to study your labor situation. I have faith in the United States and its industries that they will meet any given situation, somehow, and come out on top of the heap. In this country most of the things we worry about have a way of never happening anyway."

An Outstanding Forum

Without question, the highlight of the entire convention was an open forum on maintenance and conservation in pulp and paper mills. This forum was held on the afternoon of the first day of the meetings.

The session was opened with a paper by J. L. Ritchie, Chief, Priorities and Incoming Allocation Section, Pulp and Paper Branch, War Production Board on *Patch and Pray.*

In this paper, Mr. Ritchie in a very interesting and informative way explained some of the problems relating to critical materials of special interest to the pulp and paper industry and suggested that it is along lines of practicable substitutions that the whole industry must begin thinking.

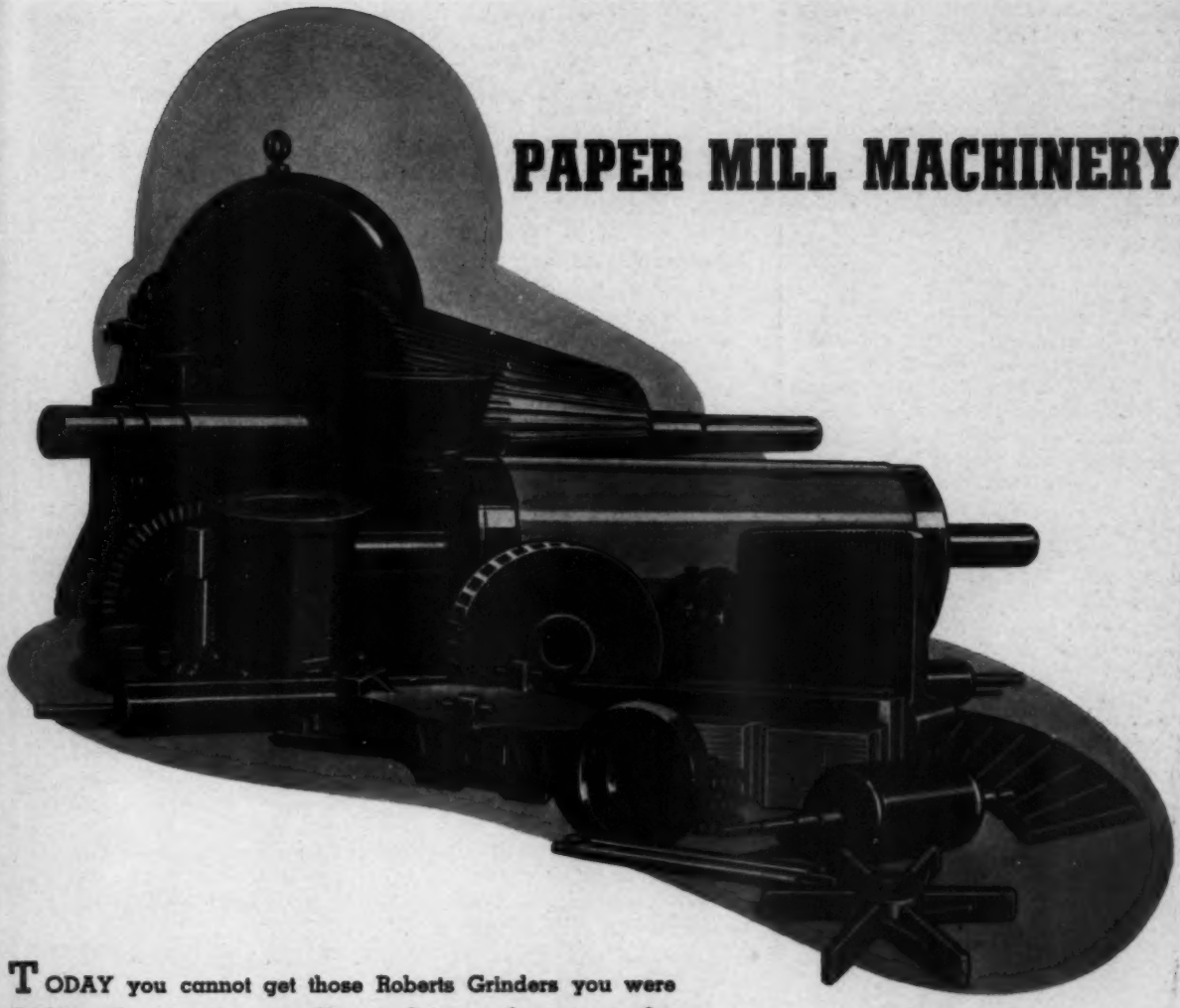
In the operation of its priorities section, the Pulp and Paper Branch, said Mr. Ritchie, recognizes a two-fold responsibility: First, a responsibility to the Government to see that there is an effective conservation to the maximum possible degree; and second, a responsibility to its industry to see that the industry's productive facilities are adequately maintained in order that a flow of paper adequate for war and civilian needs may be assured.

Stress was placed on the wire situation. In this connection, Mr. Ritchie related that the Director of Industry Operations had addressed a telegraphic order to all manufacturers of paper mill clothing instructing them not to deliver new wires for any machine unless it appears that the machine has four or less wires in reserve—that the results of a survey confirm the impression that four wires might reasonably be regarded as a practicable minimum working inventory.

Mr. Ritchie also stated that the industry may reasonably be expected in the interest of the war program to reduce its normal consumption of copper by 80 per cent; that under an amendment to *M-21,* issued on May 25, 1942, the delivery of iron and steel products except on ratings of *A-10* or higher is prohibited; that, in general, it is felt there is no justification for the use of stainless or Monel in connection with the sulphate process; that there are a few spots in the sulphite system where the use of stainless or Monel will be necessary; and that a number of fabricators of mill equipment have made experimental products from substitute materials.

William L. Batt, chairman of the Requirements Committee of WPB, said Mr. Ritchie, defined the official maintenance policy of the Government for the duration as "Patch and Pray." Mr. Ritchie concluded his paper with a plea to share your knowledge, share your ideas, share your skills—and even better, trade and barter your inventions.

PAPER MILL MACHINERY



1942

TODAY you cannot get those Roberts Grinders you were thinking about a year ago. New jordans are for gun powder instead of paper. Now it is the little things that are important, small repairs and replacements, rolls and fillings. Paper mill machinery is only a small part of our total production in 1942, but it is as important to us as it is to you. It is all that we are allowed to do now for the industry with which we have been so closely associated for more than 50 years.

We are looking ahead and preparing for the time when serving the paper industry again will be our full time job. We will be better equipped than ever before. In the meantime we are glad to put in longer hours, add more men and new machines for our part in speeding the victory that will bring that day closer.

MAINTENANCE SUGGESTIONS FOR SUPER-CALENDER ROLLS

For longer and better service—1. Condition in the stack for 18 to 24 hours, 48 if possible. 2. Use wetting agents frequently but sparingly. 3. Maintain uniform diameter. 4. Avoid sanding if possible. Use wetting and sponging method to retain surface polish. 5. Check temperature along roll frequently to determine high spots or uneven caliper paper. 6. Check alignment at intervals on chock plate bearings. 7. Paper and coating machine operators should cooperate to maintain even surface papers. 8. All filled rolls should receive constant attention.

THE APPLETON MACHINE COMPANY
APPLETON · WISCONSIN

The personnel organization for the presentation of the forum is shown in the accompanying panel.

Mr. Lagerstrom as co-ordinator for the Industrial Affiliates mentioned upon opening the forum that the purpose behind it was to aid the operating men of the industry in keeping equipment in good operating condition as well as in maintaining and conserving it.

Mr. Otto then explained the *modus operandi* of the forum and with this explanation given the forum was under way. The procedure, in brief, consisted of the presentation of a series of slides by each man on the Industrial Affiliates panel on a conservation and maintenance subject assigned to him and the answering of such questions as came from the floor as a result of the reading of each of the respective group of slides by the person presenting them and of other comments made by them. The session opened shortly after 2 P. M. and did not adjourn until about 6:30 P. M. To summarize the entire session in a single sentence, it was an epitome of information on the subject of maintenance and conservation of equipment, raw materials, and supplies—practical, pertinent, and factual.

The information presented by this panel of experts in open forum had been preprinted along with other data in a very attractive 36-page booklet which was distributed to those in attendance at the convention. This booklet thus becomes one of the valuable pieces of literature of the pulp and paper industry.

The Group Meetings

Both the second and third mornings of the convention were given over to group meetings. The meetings scheduled for the morning of the second day included the following groups: Board, Fine Papers, News Print, and Wrapping, and Tissue; while those of the third day were: Chemical Pulp; Coated Papers; Finishing, Storing and Shipping; and Plant and Power Engineers.

The chairmen of these various committees were as follows:

Board—Ollie W. Messner, Robertson Paper Box Company, Montville, Connecticut.

Fine Papers—D. J. Walsh, Parker-Young Company, Lincoln, New Hampshire.

Newsprint and Wrapping—T. E. Kloss, Maine Seaboard Paper Company, Bucksport, Maine.

Tissue—R. F. Bennett, Ecusta Paper Corporation, Pisgah Forest, North Carolina.

Chemical Pulp—Stanford G. Blan-

CO-ORDINATORS

Affiliates—T. E. Lagerstrom, International Nickel Company, New York City.

Superintendents—Earl F. Otto, Consolidated Water Power & Paper Company, Wisconsin Rapids, Wisconsin.

PANEL

Industrial Affiliates

Paper Machine Maintenance—V. S. Denison, Beloit Iron Works, Beloit, Wisconsin.

Maintenance of Converting Equipment—Walter J. Gottsch, S. M. Langston Company, Camden, New Jersey.

Maintenance of Refining Equipment—C. H. Vickery, E. D. Jones & Sons Company, Pittsfield, Massachusetts.

Maintenance of Mechanical Power Equipment—Alfred Iddles, Babcock & Wilcox Company, New York City.

Maintenance of Pulping Equipment—John Noble, Improved Paper Machinery Corporation, Nashua, New Hampshire.

Maintenance of Electrical Power Plant Equipment—W. W. Cronkhite, General Electric Company, Schenectady, New York.

Conservation of Chemicals—Ralph W. Kumler, American Cyanamid and Chemical Company, New York City.

Dyestuffs—S. S. Harkavy, Geigy Company, Inc., New York City.

Lubrication—Thomas E. Dial, Socony-Vacuum Oil Company, New York City.

Auxiliary Equipment—S. W. Fletcher, J. O. Ross Engineering Company, New York City.

Inorganic Supplies—Olin W. Callighan, Edgar Brothers Company, New York City.

Pumps—John H. Hall, Warren Steam Pump Company, Warren, Massachusetts.

Wire Conservation—Harry G. Specht, Eastwood-Nealley Corporation, Belleville, New Jersey.

Conservation of Dryer Felts—B. L. Whittier, Mt. Vernon-Woodberry Mills, Baltimore, Maryland.

Maintenance of Control Instruments—Henry O. Ehrisman, Foxboro Company, Foxboro, Massachusetts.

Packing, Insulation, and Roofing—J. W. Hemphill, Johns-Manville, New York City.

Metals, Conservation and Maintenance—R. T. Barnes, Jr., International Nickel Company, New York City.

Superintendents Association

Board Committee—Ollie W. Messner, Robertson Paper Box Company, Montville, Connecticut.

Chemical Pulp Committee—Stanford G. Blankinship, Port Royal Pulp and Paper Company, Ltd., New York City.

Coated Paper Committee—Richard Alden, Watervliet Paper Company, Watervliet, Michigan.

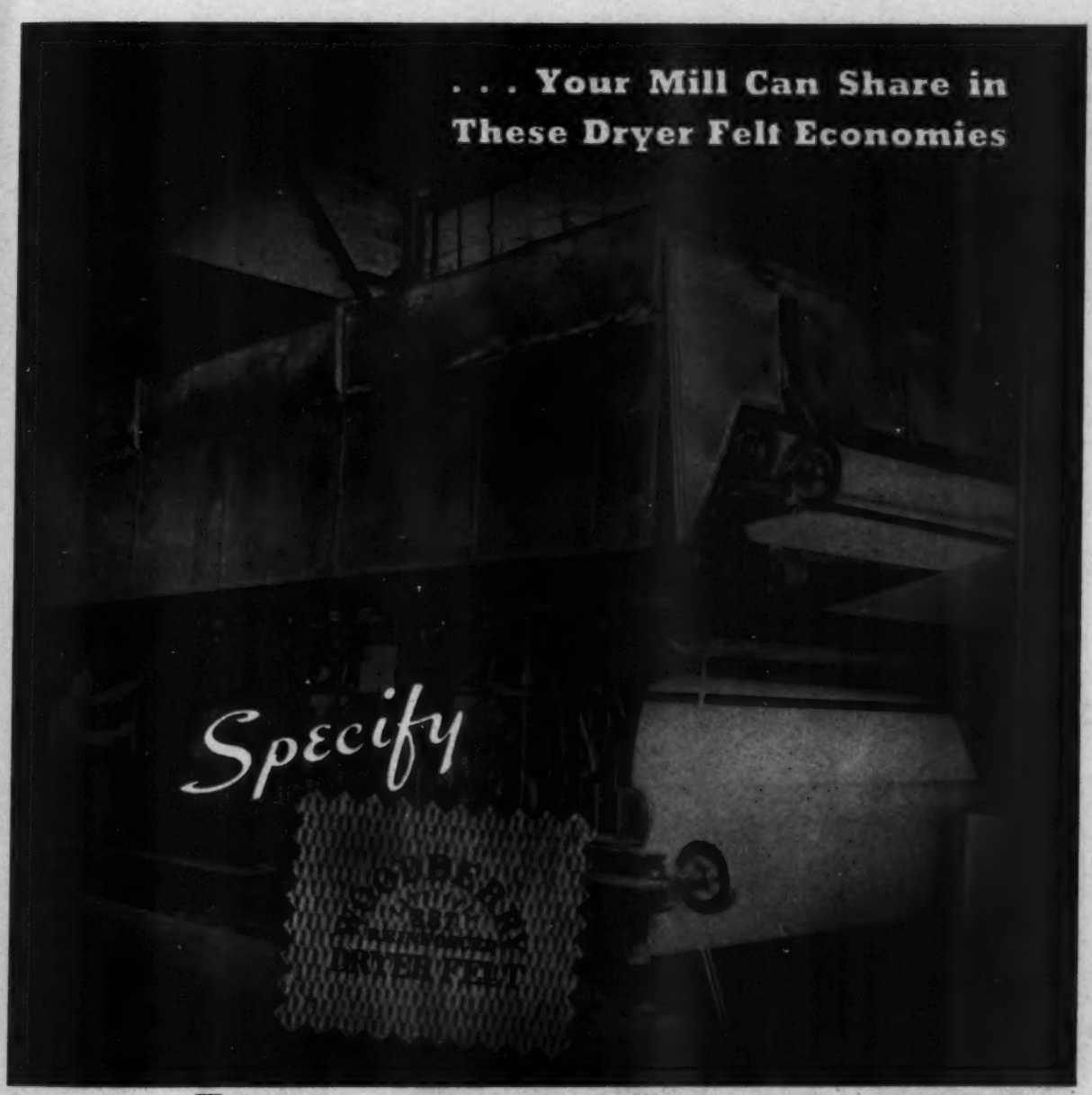
Fine Paper Committee—D. J. Walsh, Parker-Young Company, Lincoln, New Hampshire.

Finishing, Storing, and Shipping—Orville B. Ziegler, Riegel Paper Corporation, Milford, New Jersey.

News Print and Wrapping—T. E. Kloss, Maine Seaboard Paper Company, Bucksport, Maine.

Power and Plant Engineers—Grover Keeth, Marathon Paper Mills Company, Rothschild, Wisconsin.

Tissue Committee—R. F. Bennett, Ecusta Paper Corporation, Pisgah Forest, North Carolina.



THE savings being effected by WOODBERRY 887 reinforced dryer felts in paper mills all over the country spell important manufacturing economies. Reports from mill after mill, in every branch of the paper making industry, verify this claim. The patented feature of WOODBERRY 887's, is one of the factors responsible for these economies. Asbestos yarns woven at scientifically determined intervals into the face of WOODBERRY 887's endow them with much longer life. Specify WOODBERRY 887 reinforced dryer felts. Put the savings they effect on the credit side of your manufacturing ledger.

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During a game of golf that camera followed some of the players around the course. L to R: J. J. Nylund and W. S. Taylor; L. J. Meunier; Robert Nivison and R. R. Baker; Phil Divine and Harry Frost.

kenship, Port Royal Pulp & Paper Company, New York City.

Coated Papers—Richard Alden, Watervliet Paper Company, Watervliet, Michigan.

Finishing, Storing, and Shipping—Orville B. Ziegler, Riegel Paper Corporation, Milford, New Jersey.

Plant and Power Engineers—Grover Keeth, Marathon Paper Mills Company, Rothschild, Wisconsin.

The News Print and Wrapping, Tissue, Chemical Pulp, and Coated Papers group meetings were arranged for a round-table discussion on maintenance and conservation, and on processing problems. The programs of the other group meetings, in addition to similar round table discussions, included the presentation of a number of papers. There also was the showing of a motion picture "Modern Clay Equipment" by Olin W. Callighan, Edgar Bros. Company, New York City, before the Coated Papers meeting.

Two papers were presented before the Board meeting—one entitled *Plain and Suction Extraction Rolls and Their Effect on Wire Life*, by O. C. Cordes, Downingtown Manufacturing Company, Downingtown, Pennsylvania; the other, *pH Control System on Cylinder Board Machines*, by Glen Sutton, Sutherland Paper Company, Kalamazoo, Michigan.

A series of ten-minute papers comprised the program of the Fine Papers group meeting. The subjects of these papers and their respective authors were:

Vortrap's Contribution to the War Effort—Douglas Robbins, Douglas Robbins & Company, Middletown, Ohio.

Availability of Chlorine—O. T. Birkeness, Wallace & Tiernan Company, Newark, New Jersey.

Paper Machine Maintenance—Charles S. Adams, Rice Barton Corporation, Worcester, Massachusetts (Read by Stephen B. Stafford).

Conservation of Felts and Wires Through Scientific Cleaning Methods—Thomas F. O'Brien, Magnus Chemical Company, Garwood, New Jersey.

Conservation by Electroplating—D. H. Bissell, Chromium Corporation of America, New York City (Read by P. H. Dumas).

All-Out Maintenance and Substitution Program—Peter S. Sinclair, The Sinclair Company, Holyoke, Massachusetts.

Maintenance of Clean Paper—F. K. Becker, Bird Machine Company, S. Walpole, Massachusetts.

Use and Care of Paper Mill Felts—Alfred B. Perlick, Kalamazoo Vegetable Parchment Company, Parchment, Michigan.

Care, Study and Ingenuity Applied to Flat Screens—Allen A. Lowe, Sandy Hill Iron & Brass Works, Hudson Falls, New York.

Fine Papers and the War Effort—B. L. Kassing, Hammermill Paper Company, Erie, Pennsylvania.

Fourdrinier Wires in the War Effort—Harry G. Specht, Eastwood-Nealley Corporation, Belleville, New Jersey.

Conservation of Paper Making Materials—Homer T. Latimer, Champion Paper & Fibre Company, Hamilton, Ohio.

Maintenance and Substitution—W. F. Hoffman, Fitchburg Paper Company, Fitchburg, Massachusetts.

Car Loading of Skid Paper was the subject of a paper by George W. Craigie, field secretary of the Association, and this paper was on the program of the Finishing, Storing and Shipping Meeting; while *More Steam Without Boilers* was the title of a paper by George H. Urban, Marathon Paper Mills Company, Rothschild, Wisconsin. Mr. Urban's paper was presented before the group meeting of Plant and Power Engineers.

Election of Officers

The afternoon of the third and last day of the convention was given over to a business meeting. At that meeting, the several reports of the committees, announced on the first day of the convention, were read and approved. Likewise, plans for immediate and future action on the part of the Association were discussed at some length. Election of officers for the ensuing year also was conducted. This election resulted in the following slate of officers:

President—Grover Keeth.

First Vice President—Stanford G. Blankinship.

Second Vice President—Raymond L. Barton.

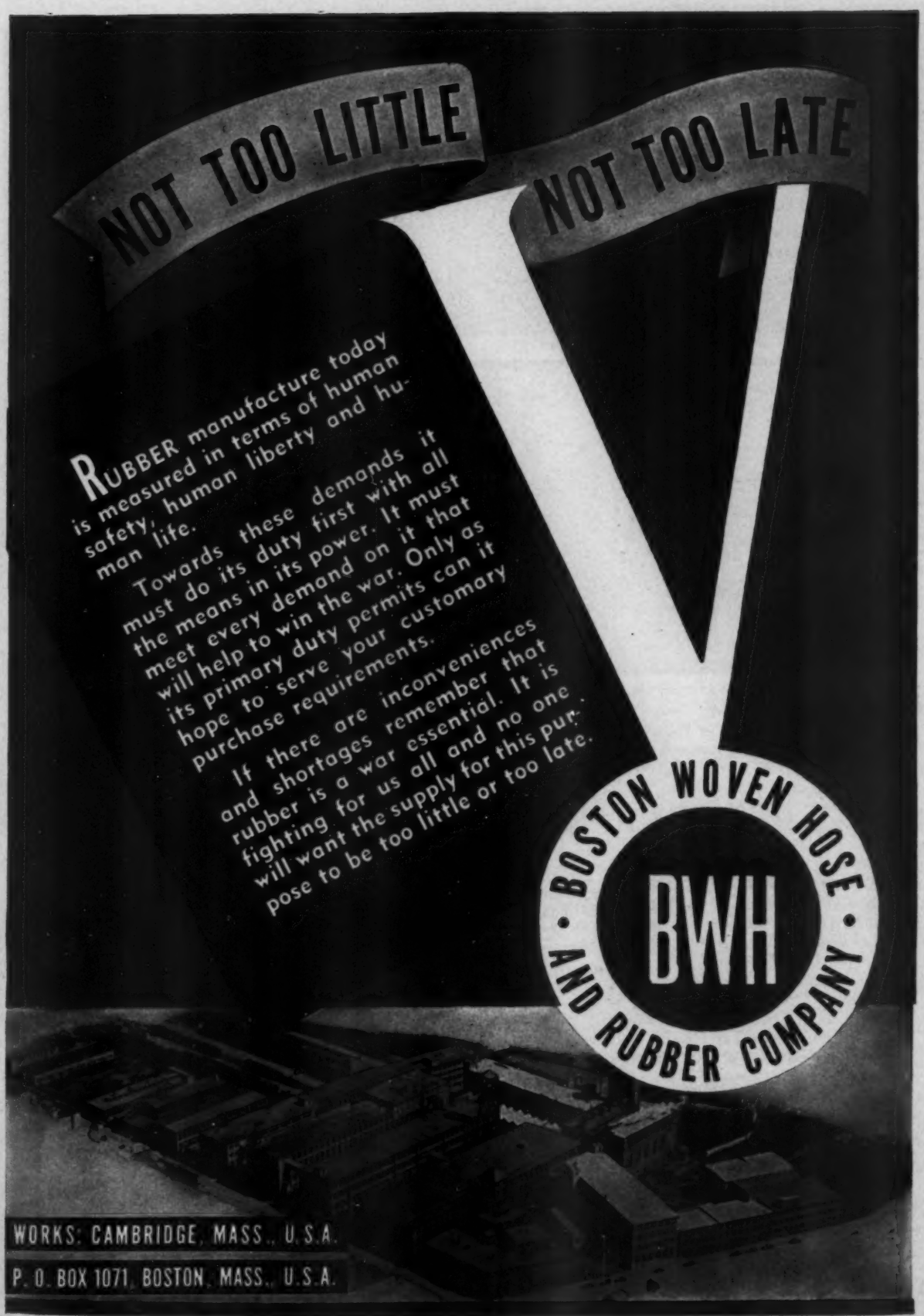
Third Vice President—Niles M. Anderson.

Fourth Vice President—Homer H. Latimer.

Fifth Vice President—Raymond F. Bennett.

Sports Events

Blythefield Country Club was the scene of the annual golf tournament which was held on the afternoon of the second day of the convention. The winners at the meet were as follows:


NOT TOO LITTLE
NOT TOO LATE
V
RUBBER manufacture today is measured in terms of human safety, human liberty and human life.
Towards these demands it must do its duty first with all the means in its power. It must meet every demand on it that will help to win the war. Only as its primary duty permits can it hope to serve your customary purchase requirements.
If there are inconveniences and shortages remember that rubber is a war essential. It is fighting for us all and no one will want the supply for this purpose to be too little or too late.
BOSTON WOVEN HOSE AND RUBBER COMPANY
BWH
WORKS: CAMBRIDGE, MASS., U.S.A.
P. O. BOX 1071, BOSTON, MASS., U.S.A.

Skeet and Trap Shooters

Above—(L to R) First Group: A. L. Barowski, Walt. Morehouse, J. D. Henderson, George Dougherty (who won high skeet), and P. H. Tigwell. Second Group: C. Swett, K. A. Forrest, R. I. Nilsen, F. G. Ramsden, and D. T. Birkeness. LEFT—A. L. Holcomb, H. P. Baumann, M. J. Foley, Oscar Stamets, and E. C. Jacobi. The camera took a turn and caught "Bub" Jacobi off by himself. It must have known he would win high trap.

Superintendents

First Low Gross—Charles Ludwig, Mead Corporation.

Second Low Gross—J. R. Simpson, Champion Paper & Fibre Company.

High Gross—L. H. La Liberte, Kalamazoo Vegetable Parchment Company.

First Low Net—Rudolph Meyer, Badger Paper Mills, Inc.

Second Low Net—T. M. Barry, Fraser Paper Company, Ltd.

Blind Bogey—L. J. Smith, Combined Locks Paper Company.

Salesmen

First Low Gross—P. K. Devine, Magnus Chemical Company.

Second Low Gross—W. W. Campbell, Lockport Felt Company.

High Gross—E. A. Johnson, National Aniline & Chemical Company.

First Low Net—F. K. Becker, Bird Machine Company.

Second Low Net—E. Peterson, Youngstown Welding & Engineering Company.

Blind Bogey—W. Moore.

Longest Drive—P. S. Cade, Harding Jones Paper Company.

Nearest Pin—George Hermann, Hermann Manufacturing Company.

Charles Ludwig, in winning the First Low Gross for the Superintendents, won permanent possession of the coveted Superintendents Golf Trophy, presented by Hercules Powder Company, and won twice previously by Mr. Ludwig. Mr. Ludwig also was presented with a $25 War Bond.

The other winners in the golf tournament received either War Bonds or Stamps, depending upon the nature of the individual accomplishment.

While the golf tournament was in progress, an equally enthusiastic group of fans participated in a skeet and trap shooting contest at the Creston Rod and Gun Club in which E. Dougherty, Holyoke Wire Cloth Company, received the High Skeet prize, and E. C. Jacobi, Sandy Hill Iron & Brass Works, the High Trap prize.

Breakfasts, Luncheons, and Banquet

A men's breakfast was held on both the second and third mornings of the convention. At the first of these two breakfasts, S. G. Blankinship presided; at the second, Raymond L. Barton. The purpose behind these breakfasts was to start off each day with fifteen minutes of fun, and that surely was accomplished by Roger Allen, the scheduled speaker at both breakfasts. His humor and wit brought many a smile, some laughs, and even vociferous comment from his listeners, even so early in the morning.

D. L. Stocker, president and general manager, Michigan Paper Company, Plainwell, Michigan, was the toastmaster at the men's luncheon on the first day of the meetings. At this luncheon, Frank Whitwam, secretary of the Graphic Arts Association, in the absence of Mayor George W. Welsh from the city, welcomed the group to Grand Rapids. His remarks were brief but humorous and kind. Grover Keeth responded to this welcome on behalf of the Association.

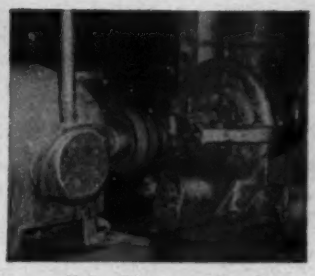
At the joint dinner, following the golf tournament, all sports prizes were presented to the winners. V. S. Denison, Beloit Iron Works, Beloit, Wisconsin, was the toastmaster. This program also included some very enjoyable entertainment and dancing.

Glen Graham, Sutherland Paper Company, Kalamazoo, Michigan, was toastmaster of the joint banquet on the evening of the last day of the convention. During the progress of the banquet, the past president's jewel was presented to Oscar Stamets by Charles Champion. Mr. Stamets also was presented with the L. D. Post Trophy, a Hamilton watch, by John Cornell of *Paper Mill News*.

Above—Moore turbo-generator unit, condensing extraction type, serving a Canadian paper mill

Horizontal duplex air compressor, motor-driven, installed in a southern paper mill

0,000-lb. storage type deaerating dwater heater, in paper mill service



Motor driven centrifugal pump, handling white water

Centrifugal pump, transferring black liquor and salt cake to a recovery unit

Paper stock pump, in a prominent midwestern mill

Motor-driven turbine well pump, for main mill water supply

OUR DUAL OBJECTIVE ... in Wartime service to the Paper Industry

WORTHINGTON products are not built to serve for this period of emergency only. They must continue to operate for many years after the paper industry returns to peace-time production. Therefore there can be no letting down of the rigid standards that have been set for these products as a basic Worthington principle.

It is our aim that Worthington equipment, produced during this difficult period, shall accomplish two purposes . . . first that it shall serve effectively, and without interruption, on the important jobs which it fills . . . and second that, in so doing, it shall make new friends, and retain the confidence of old friends, among the nation's paper producers.

To those mills where Worthington equipment is now in use, we offer the services of our district office engineers, and our headquarters staff, in checking conditions and performance, with a view to assuring continued operation at top efficiency. In numerous cases, they have been able to make recommendations for more effective use of installed units.

And in the planning of readjustment or expansion, whether for the war production program or the period to follow, the counsel of these specially qualified engineers is always available.

rthite centrifugal chemical pumps, h cast iron frames, 3/4" to 3" sizes

Centrifugal 6-stage boiler feed pump, turbine-driven

WORTHINGTON PUMP AND MACHINERY CORPORATION

General Offices: **HARRISON, NEW JERSEY**

WORTHINGTON

"Paper in Our National Life"

The guest speaker of the evening was John L. Riegel, president, Riegel Paper Corporation, Milford, New Jersey. The subject of his address was *Paper in Our National Life*. Some of the interesting statements made by Mr. Riegel follow:

"Few people realize the importance of the relationship of the paper industry to the war program and the essentiality of the industry to the civilian economy.

"In 1941, government sources estimated as high as 40 per cent of our total paper and paperboard production would be required for direct and indirect war needs.

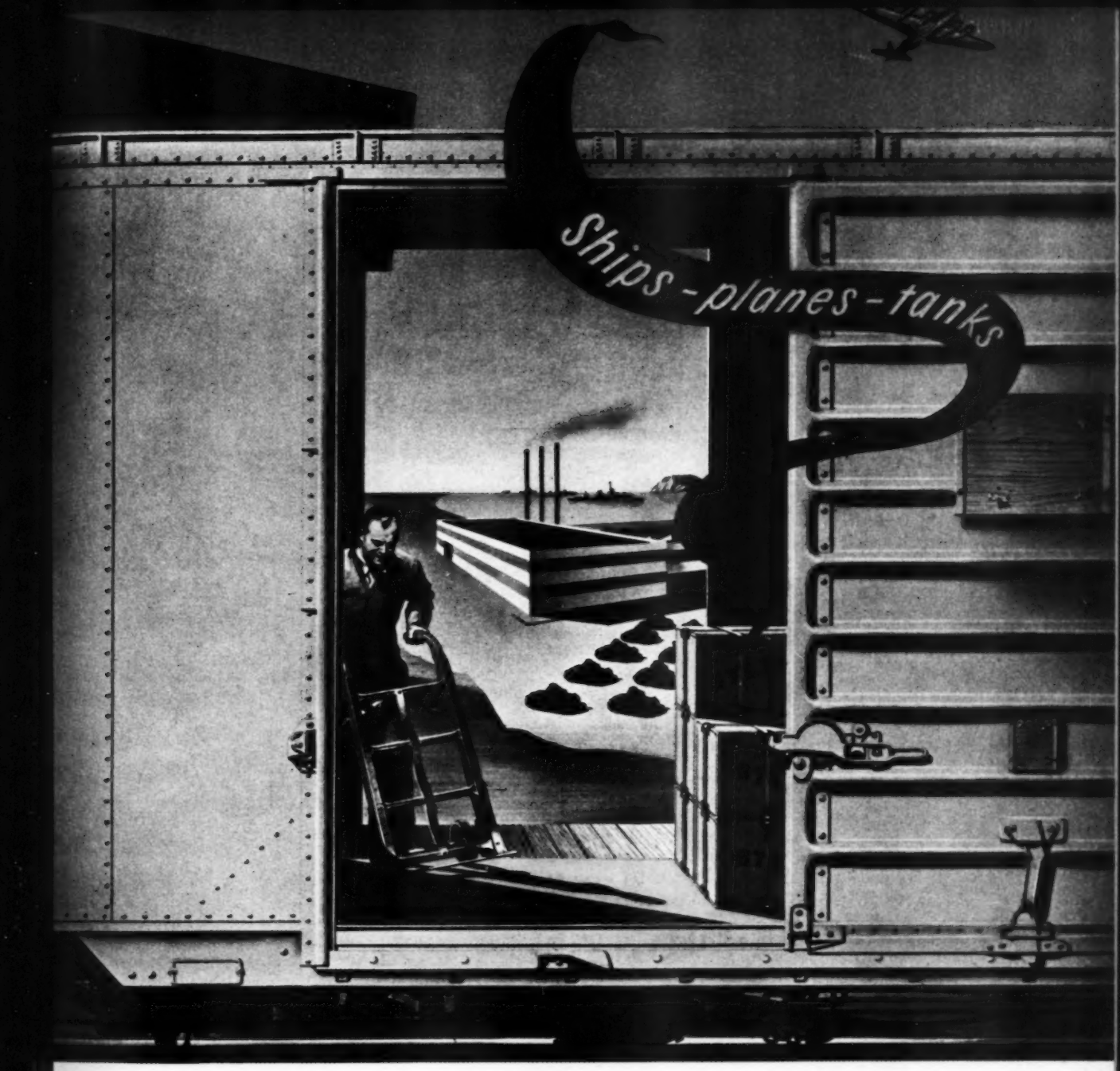
"Tremendous quantities of writing and printing paper are involved in the registration, induction, classification, and instruction of the vast pool of manpower that will eventually make up our armed forces. With the armed forces organized, paper plays an even more important part. The vast regulatory and administrative activities of the armed forces are almost wholly dependent on paper. Battle plans, orders and clerical activities of the Army and Navy require large quantities.

"In the manufacture of equipment and supplies used in the war effort paper plays a vital part. Blueprint paper, template paper for ships, paperboard for the insulation of airplanes and tanks, condenser paper for radios, cable paper, filter paper for gas masks, photographic paper, meter and chart papers, paper and paperboard for the protection and packaging of some assembly parts moving to the great bomber plants and the many other plants building military and naval equipment—these are only a few of the many types required.

"To a large and increasing degree explosives made with a wood cellulose base are being used by the Army and Navy. Wadding paper is used in shells and cartridges, and shipment of ammunition is largely in paper or paperboard containers.

Ralph Hayward, Kalamazoo Vegetable Parchment Co., and president of TAPPI, shakes hands with Glen Graham, Sutherland Paper Co., who acted as toastmaster at the banquet. Mr. Graham substituted for L. W. Sutherland, who was unable to attend. Standing back of Mr. Graham is Grover Keeth, Marathon Paper Mills Co.; seated at his right is John Riegel, Riegel Paper Co., and president of the American Paper and Pulp Association, who was guest speaker at the banquet. Seated on the other side of Mr. Graham is Oscar Stamets, Riegel Paper Co., president of the Association.

The luncheon held on Tuesday, the first day of the Convention, was well attended.



Even before they're made they must travel

American planes could never hope to dominate the skies . . . American tanks could never crash their way to victory . . . American ships could never hope to succor a desperate world . . . if American *transportation* had not first done the biggest job of its kind in history.

At a time when *everything* depends upon a free flow of traffic, the American transportation system has worked so magnificently that America, like a man with a good stomach, has scarcely been aware of its existence.

Even before ships, planes, tanks and guns are made, the railroads and other means of transportation must carry the raw materials thousands of miles from a thousand suppliers to a thousand different parts of the nation.

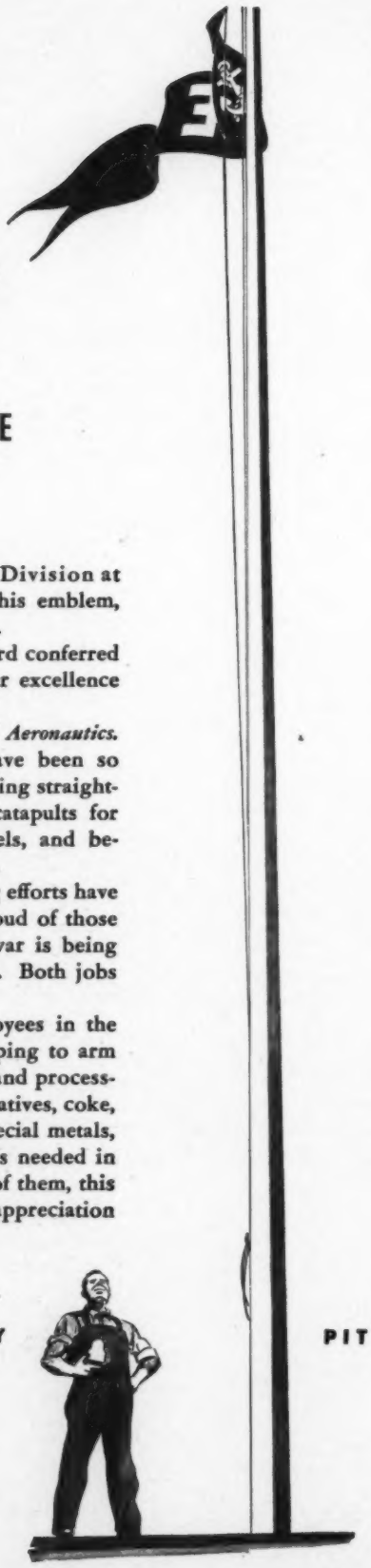
Koppers has been able to furnish supplies of basic materials needed by the transportation industries . . . from Koppers coal mines, from Koppers plants where ties and other wood products are pressure-treated to give them long life, from Koppers creosote refineries, from Koppers roofing and waterproofing plants, and paint factories . . . from plants which make packing for steam locomotives and piston rings for Diesels.

Maybe, some day in the future, these products may serve your peacetime operations as they are now serving wartime safety. Koppers Co., Pittsburgh, Pa.

KOPPERS

THE INDUSTRY THAT SERVES ALL INDUSTRY

BUY UNITED STATES WAR BONDS AND STAMPS



for

DISTINGUISHED SERVICE

Our workers in the Bartlett Hayward Division at Baltimore are now privileged to wear this emblem, a mark of unusual honor and distinction.

It symbolizes the most respected and coveted award conferred by the United States Navy on civilians: the "E" for excellence in industrial production.

This award was recommended by the *Bureau of Aeronautics.* Only two other American industrial concerns have been so honored. It was given because of ingenuity in applying straight-line, mass-output methods to the production of catapults for launching airplanes from the decks of naval vessels, and because of substantially bettering scheduled deliveries.

We are proud of these employees whose unceasing efforts have been so dramatically recognized, just as we are proud of those who are now serving in the armed forces. This war is being fought in the factory as well as on the battle-front. Both jobs must be *well done.*

All over the country, thousands of fellow-employees in the Koppers organization are likewise engaged in helping to arm America. They are building by-product coke plants and processing plants, producing coal and its innumerable derivatives, coke, chemicals, treated timber products, piston rings, special metals, fabricated parts and other materials and implements needed in titanic quantities by The United Nations. To each of them, this Navy "E" will bring added inspiration and a new appreciation of the vital importance of his share of the job.

KOPPERS COMPANY **PITTSBURGH, PA.**

KOPPERS...THE INDUSTRY THAT SERVES ALL INDUSTRY

"The protection and shipment of food to the armed forces and for lend-lease involves not only enormous quantities of standard packaging papers and board, but many other special types of plain, waxed, and treated sulphite, glassine, greaseproof, vegetable parchment, kraft, and board. Sanitation requires tissues and absorbent papers. Most surgical supplies are protected by paper.

"Governmental activities are also largely dependent on a continuous supply of paper for use by the Printing Office, the Office of Price Administration, the War Production Board, the Office of Defense Transportation, and other war agencies, in issuing the vast quantities of instructions and regulations over which we all struggle.

"From the important standpoint of civilian necessity, defense, education, and morale, paper assumes an important part. Our whole complicated business structure could not function without paper for communication, administration, design, construction, advertising, and shipping. Civilian defense requires paper for printing aid raid precautions, first-aid instructions, questionnaires, ration cards, and records. Without paper, newspapers, periodicals, and textbooks would be impossible, and without these our educational system would founder. The maintenance of civilian morale requires paper for posters, newspapers, magazines, mail, radio scripts, and moving pictures. Also, without paper, it would be impossible to sell and print War Bonds and Stamps.

"All these requirements — Army, Navy, Government and Civilian—add up to the imposing total of an estimated twenty million tons consumption for 1942.

"The United States normally produces 50 per cent of the entire paper production of the world and consumes, together with paper imports, nearly 60 per cent of the world's consumption of paper and paperboard. The constantly increasing use of paper and paperboard products has established the primary industry alone as the sixth largest in the United States. The total investment of the industry is large, the value of its physical plant and forests being approximately two and one-half billion dollars. The value of its annual production totals one and one-half billion dollars.

"Within the primary industry a severe hardship is imposed on the workers if curtailment of production occurs, since the mills are located largely in rural areas and geographical shifting of employment is difficult. The 753 mills of the country are scattered throughout 37 states, 63 per cent of the mills being located in communities with less than 25,000 population. In many communities the mill is the chief, if not the only source of industrial employment. Remove the mill and the local economy collapses.

"Even more important from the national standpoint than the welfare of the workers of the pulp, paper and paperboard industries and the allied industries, is the place of paper itself in the business world. A serious shortage in paper would cause severe disturbances in all industry.

"We should manufacture and sell all the pulp, paper and paperboard that we can, provided it does not hurt the war effort of the country. The paper industry can get along with a very small percentage of the highly critical materials, and can turn out enormous quantities of a product which is most essential and useful in our national life. I think that the paper industry can serve the country by meeting not only the war requirements but the civilian requirements on a large scale.

"During the latter part of 1941 preliminary shortages of critical metals and other materials gave us a preview of what would be required in the way of ingenuity and resourcefulness in

Seated at the speakers' table at the Tuesday Luncheon were: (L to R) Edward G. Ames and E. W. Tinker, American Paper and Pulp Association; D. L. Stocker, Michigan Paper Co.; Oscar Stamets, Riegel Paper Corp., and president of the Association; Grover Keeth, Marathon Paper Mills Co., elected president of the Association for the coming year; James Ritchie, Chief Priorities Division and Incoming Allocation Section, Pulp and Paper Branch, WPB; Allen Hyer, Black-Clawson Co.

Three representatives of the Affiliates Group talk things over with a paper mill superintendent. L to R: A. O. Bragg, Diamond Alkali Co.; W. B. Morehouse, National Oil Products Co.; Ray L. Barton, Michigan Paper Co.; and A. Fred Crossman, Lindsay Wire Weaving Co.

meeting the situation that promises to develop in 1942. Today the picture is a little clearer. The industry will have to cut to the bone in its use of copper, tin, rubber, aluminum and other metals and materials. This will require the utmost efforts in conservation and substitution.

"During this meeting there have been some very excellent suggestions made as to how the required conservation may be best accomplished. You men are, of course, important in seeing that conservation and salvage programs are carried out. The executive must also carry his share of the burden in seeing that the conservation program is given the proper support. On the other end of the scale is the machine tender, millwright, machinist or other mechanic upon whom in the final analysis the real job of accomplishing results depends. Information must be placed in the hands of these men in the form of practical, workable suggestions, and I feel sure that if this is done the desired result will be accomplished.

"Although we can let nothing interfere with our war effort, it is not too early to be thinking of our industry after the War. The readjustment from war to peace will undoubtedly be difficult, the enormous debt will be a problem, but the ability of our people and the resources of our country make a solution of these problems possible.

"In the post-war period there undoubtedly will be great competition from new, cheap, and plentiful materials, as well as from new methods and new products. In such a period I see no reason why the paper industry should not forge ahead. The great flexibility within the paper and paperboard industry, the low cost of its fiber as compared with other fibers, give great advantage. New uses will be found for paper and some of the new materials will be found to combine with paper. New products will require packaging, and new types of paper and paperboard packages will be developed."

Ladies Program

The ladies who attended the convention also enjoyed a well-arranged program. There was a theatre party on the program for the first evening. A luncheon, style show, and bridge tournament, all at Herpolsheimer's, were the scheduled events of the next afternoon. The program of the last day included a visit to the Grand Rapids Furniture Museum in the morning, luncheon at the Women's City Club, and a talk on fabrics, wall papers, and floor coverings by Edward B. Rhodes of the Schumaker Company, of Grand Rapids.

The women also joined with the men for the dinner meeting on the evening of the second day and for the banquet on the evening of the third day, the banquet bringing to a close the twenty-third annual convention of the Association.

Commendation for Committees

A word of praise should be extended to each and every member of the several committees and to every other person who in any way aided in the promotion of, or in the putting over of, the convention. The job this year was unusually hard. As Mr. Stamets mentioned in his President's Message, at times even the holding of the convention was in the balance because of the War. In spite of the uncertainties, however, planning was done, and now the meeting is history —a very successful convention of the American Pulp and Paper Mill Superintendents Association.

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CAN. FORESTRY ASS'N STRESSES CONSERVATION

The increasing demands of wartime for highter standards of forest conservation was the subject of a very well attended conference of the directors of the Canadian Forestry Association held at Montreal on June 16.

Eleven traveling lecture parties in the woodland communities from coast to coast, extensive programs of radio broadcasting, and other educational channels are included in the current year's plan for public instruction in the saving of the forest resources, in readiness for postwar opportunities. The Association has taken a constructive part in planning the absorption of surplus labor after the War through practical schemes of improving the forest resources, including the lessening of forest fire hazards, and the enhancement of the country's attractions for tourists.

Those in attendance were informed that under the leadership of the Reconstruction Committee of the Dominion Cabinet, comprehensive steps were being taken to remedy unemployment in the postwar period by arrangements made well in advance for the use of a large number of men in nationally-beneficial works which in time would prove self-liquidating.

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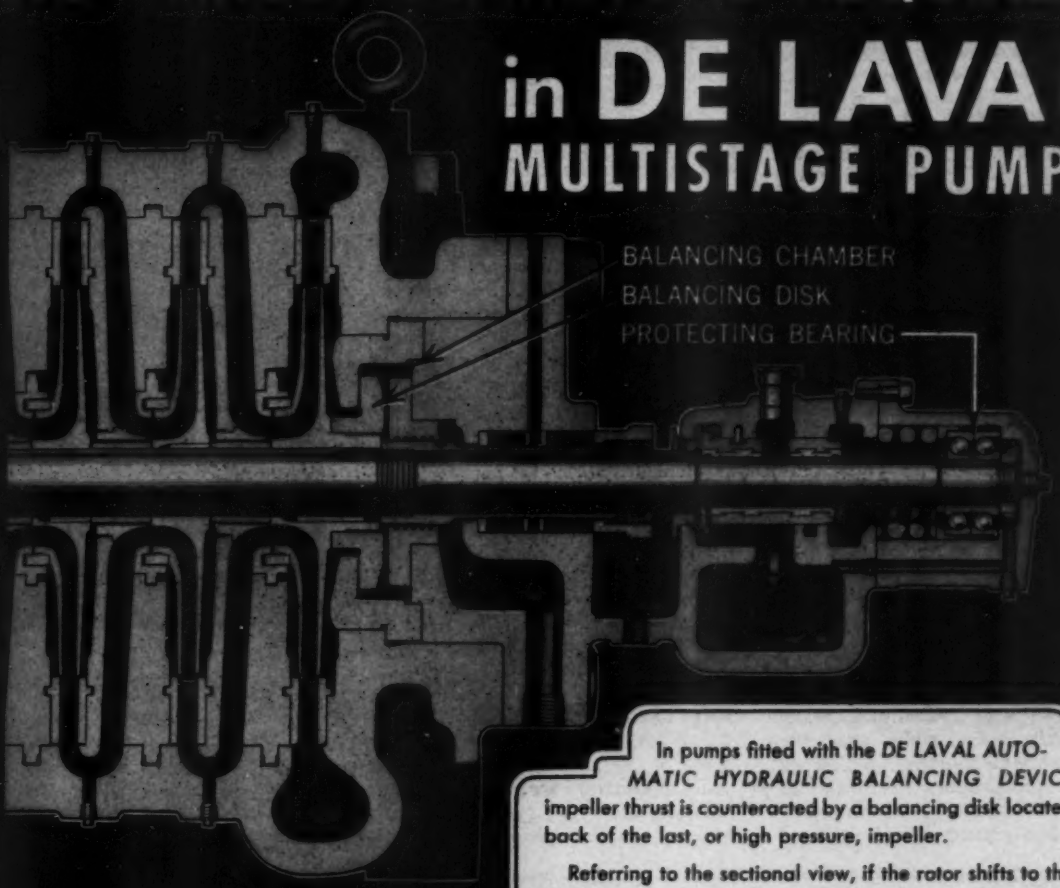
PERMIT REQUESTED TO BUILD SULPHITE WASTE LIQ. PLANT

The technical division of the Sulphite Pulp Manufacturers' Committee on Waste Disposal has requested permission of the War Production Board to construct a semi-commercial plant for the treatment of sulphite waste liquor at the Interlake Pulp and Paper Company at Appleton, Wisconsin.

Development work on the disposal problem has been in progress at the Institute of Paper Chemistry, located just above the Interlake mill, for the past two years. This new plant, which will cost about $12,000, will enable the group to expand its study on the waste and pollution problem.

NO THRUST BEARING IS REQUIRED in DE LAVAL MULTISTAGE PUMPS



In pumps fitted with the *DE LAVAL AUTOMATIC HYDRAULIC BALANCING DEVICE* impeller thrust is counteracted by a balancing disk located back of the last, or high pressure, impeller.

Referring to the sectional view, if the rotor shifts to the left, the pressure in the balancing chamber decreases, counteracting the tendency to shift, and vice versa. So long as the pump receives liquid there is no perceptible movement and no contact of the balancing disk with the casing ring.

However, to prevent rubbing in case the pump should be operated dry, a spring-loaded protecting bearing is provided to hold the rotor out of contact with the stationary parts. Normally, it does not come into contact with its positioning shoulder while the pump is running.

Many earlier De Laval pumps having hydraulic balancing, but without the protecting bearing, have for years fed, and still feed, high pressure boilers.

Further discussion of multistage pump design will be found in Catalog P-3621, sent upon request.

Two turbine-driven and one motor-driven combination boiler feed and condensate pump units, 1455 g.p.m. each against 1110 p.s.i.

DE LAVAL Steam Turbine Co.
TRENTON, N. J.

CANADIAN TECHNICAL SECTION HOLDS SUMMER MEETING

▶▶▶ THE SUMMER MEETING of the Technical Section, Canadian Pulp and Paper Association, held at the Seigniory Club, Montebello, Quebec, June 18 and 19, attained a record registration of 158. The Canadian Pulp and Paper Association was represented by the president, R. L. Weldon; F. G. Robinson, past president; and A. E. Cadman, secretary-manager. Visitors from the United States included R. S. Kellogg of the Newsprint Service Bureau, New York City, whose record of attendance at meetings of the Canadian Technical Section is almost unbroken.

Under prevailing conditions, the program was briefer, more serious, and less diversified than is customary at summer meetings. During three half-days, group discussions were held on the broad verandas of the Club, overlooking the Ottawa River. Each standing committee of the Section sponsored at least one question-and-answer period, and most groups sat more than once. A session of timely interest was arranged by the Engineering Committee in a discussion of possible substitutes for materials which are now scarce or unobtainable. Other topics under consideration were: the effect of chlorine shortages on bleached sulphite production, utilization of waste sulphite liquor, newsprint printing problems, board formation, board stock preparation, as well as numerous more specific questions pertaining to all phases of pulp and paper manufacture.

E. D. Hyndman, chairman for the current year, presided over the Technical Section dinner, the only function in which the entire membership participated. Elliot M. Litt'e, formerly of Anglo-Canadian Pulp and Paper Mills, Ltd., Quebec, and now Director of National Selective Service, reviewed briefly the current regulations governing employment in Canada, and spoke on the broader problems of efficient utilization of manpower and resources both in wartime and in the reconstruction period. The speaker was thanked by H. D. Hyman, vice chairman of the Section. Mr. Weldon conveyed the greetings of the Canadian Pulp and Paper Association to the members. Informal dancing followed the dinner.

A number of members stayed over for a day to take part in the annual golf tournament. Honors went to Consolidated Paper Corporation, Ltd., Montreal, for the third year in succession when Wallace Easton of the Belgo Division, Shawinigan Falls, won the R. A. MacInnis trophy with a gross of 80 and a net of 69. Ben Jones of Ontario Paper Company, Ltd., Thorold, drove 285 yards at the 12th hole to win the driving contest.

CARTON ASS'N HOLDS A TWO-DAY OUTING

Approximately 30 representatives of a dozen paraffin carton manufacturing concerns attended the Paraffin Carton Association's annual two-day informal outing June 25 and 26 at the Gull Lake Country Club, east of Kalamazoo, Michigan.

Robert E. Rutledge, president of the Sutherland Paper Company, Kalamazoo, and Don M. Wilson, in charge of Sutherland's paraffin carton sales division, arranged the program, which consisted primarily of golfing, fishing, and informal business discussions.

Companies represented included the Menasha Paper Products Company, Menasha, Wisconsin; Gardner-Richardson Company and Richardson-Taylor-Globe Company , Cincinnati, Ohio; Container Corporation and Chicago Carton Company of Chicago; Bloomer Brothers Company, Newark, New York; Rike Manufacturing Company, Dayton, Ohio; Michigan Carton Company, Battle Creek, Michigan; Butler Carton Company, Toledo, Ohio; Waldorf Paper Products Company, Minneapolis, Minnesota; National Carton Company, Joliet, Illinois; and Sutherland Paper Company.

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KALAMAZOO SEC. TAPPI HOLDS ITS ANNUAL OUTING

The annual golf outing and dinner of the Kalamazoo Valley Section, Technical Association of the Pulp and Paper Industry, was held at the Kalamazoo Country Club on June 4.

Frederick D. Elliott, chief chemist with the Michigan Research Laboratories in Kalamazoo, affiliated with the E. J. Kelly Ink Company, was elevated to chairman of the Section, succeeding Fred Chappell, Sutherland Paper Company, Kalamazoo, Michigan. Other officers elected unanimously were: vice chairman, Arthur Weinland, Lee Paper Company, Vicksburg, Michigan; secretary, Frank Hamilton, Allied Paper Mills, Kalamazoo; treasurer, E. V. Taylor, American Cyanamid and Chemical Corp., Kalamazoo.

Ralph Hayward, president of the Kalamazoo Vegetable Parchment Company and national president of TAPPI, was the banquet speaker. Mr. Hayward discussed policies of the national organization, explaining its prime purpose to be one of "developing men within the paper industry, leading to the development and improvement of processes, machines, and the industry."

Frederick D. Elliott

The dinner and outing, sponsored by 46 paper mill suppliers, was under the general chairmanship of O. W. Callighan, Kalamazoo representative of Edgar Brothers Company.

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▶▶▶ ARTHUR W. POHLMAN, PRESIDENT, and all other officers of the Paper Club of New York were re-elected at the annual meeting, which was attended by more than 100 resident and none-resident members. All members entering the armed services will be carried on the rolls without payment of dues for the time they are on military duty.

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CONVENTIONS AND COMING EVENTS

Sept. 29-Oct. 1—Fall meeting of the Technical Association of the Pulp and Paper Industry, Hotel Statler, Boston, Massachusetts.

Oct. 5-9—The Thirty-first National Safety Congress and Exposition at the Stevens Hotel, Chicago.

Nov. 17-22—National Chemical Exposition, at the Stevens Hotel, Chicago.

Nov. 30-Dec. 5—15th National Exposition of Power & Mechanical Engineering, Grand Central Palace, New York City.

How to Increase Life and Cut Cost of Paper Machine Felts

By JOHN D. FLEMING, Sales Development Department
MONSANTO CHEMICAL COMPANY

THERE ARE A NUMBER of danger spots in any paper mill where microorganisms can cause a lot of costly trouble if allowed to thrive unchecked. Among these are your paper machine felts.

Here the environment is usually very much to the liking of proteolytic bacteria. Food supply, moisture, air tension, temperature, light, chemical reaction—all the controlling factors are often just right for these particular microorganisms. And as they grow and multiply, expensive felts rot.

In fact, cases are on record where felts have rotted and have had to be replaced after as little as five days' use!

5 to 8 weeks added to felt life

Keeping your entire system free from slime will help preserve the felts, of course, but specific treatment with Santobrite, Monsanto's highly effective bactericide and fungicide, is usually also essential for maximum felt life. By such treatment several leading mills which formerly had to change felts after only a few days' service have been able to extend the life of their felts to five or six and even eight weeks!

During a shutdown, a felt can be impregnated with enough Santobrite for effective protection by simply running it through a bath of 0.5 to 1.0% Santobrite solution or by spraying it with such a solution. Cost of such a treatment will vary from fifty cents to a dollar per application, yet it may add weeks to the useful life of a $70 to $700 felt.

Drip pipe provides continuous treatment

Another method of application of particular interest now that few mills can spare the time or lost production for their usual periodic cleanups, is through a drip pipe extending across the width of the felt in the machine. By this means, your felts can be protected with a Santobrite solution without waiting for a shutdown.

It should also be noted that Santobrite is useful at a number of other points as well as on machine felts. Chemically stable, non-corrosive to metals, non-volatile, practically odorless, it is well suited to the paper industry's need for an anti-slime treatment effective *throughout the mill* against *both* fungi and bacteria. One important characteristic which greatly increases its efficiency wherever it is used—*it is not spent on organic matter as is chlorine.* On the contrary, it tends to concentrate in the system.

Supplies of the raw materials from which Santobrite is made are critical, and it is essential, therefore, that the most efficient possible use be made of every ounce of the product. Manufactured in powder or briquette form, Santobrite requires no expensive apparatus for satisfactory application, and, when properly handled, its use involves no health hazard to mill operators or consumers of the mill product.

For experienced technical advice on how you can protect *your* machine felts—and your entire mill—from the ravages of bacteria and fungi, inquire: MONSANTO CHEMICAL COMPANY, Organic Chemicals Division, St. Louis, Missouri.

DISTRIBUTION OF BLANKETS BROADENED

The National Paperboard Association has notified paperboard and paper mills that have been contributing to The Maple Leaf Blanket Fund of a much wider distribution of blankets.

Allied Relief Agencies are in process of consolidation. The British, Canadian, Anzac, and Netherlands agencies will be consolidated to form the United War Relief. This agency will work in close co-operation with the Russian and Chinese relief, which for the present, will not be physically consolidated with the others.

The Maple Leaf Fund will become the Canadian Unit of the consolidated agency and agrees to continue the program on exactly the same basis as before. It will arrange to collect conversion money and will be responsible for conversion, packaging and delivery. Mills making shipment of felt can earmark this felt for any one of the foreign areas. Shipments not so earmarked will be delivered to those locations where the need is greatest.

Our State Department in its supervision of various relief organizations has endeavored to keep the foreign relief agencies separate from domestic organizations, such as The Red Cross and the U. S. O.

The Blanket Committee of the National Paperboard Association feels that in broadening its distribution it will stimulate the interest that already has been shown, and that an increasing number of mills will desire to contribute their felts for this very worthy cause.

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PRIORITY DIGESTS—SUPPLEMENT "B"

According to releases from the American Paper and Pulp Association, the following changes have been made in Priorities Affecting the Pulp and Paper Industry. The additions and revisions are supplementary to Digest of Priorities Affecting the Pulp and Paper Industry which was published as Section Two of the May, 1942, issue of this magazine. Supplement "A" appeared in the June issue, page 294.

ADDITIONAL

Priorities Regulation No. 9

Export ratings assigned on Form PD-311 or other prescribed forms (944.30).

Priorities Regulation No. 10

This order has been issued to establish a method for regulating the production and distribution of nearly all goods.

Priorities Regulation No. 11

Supplementing the original release of this Regulation, the APPA advises that the pulp and paper industry is *not* exempt from the Production Requirements Plan.

L Orders

L-121, Construction Lumber
L-123, General Industrial Equipment
L-146, Welding Rods and Electrodes

M Orders

M-103, Dyestuffs
M-161, General Inventory Order

AMENDED

Amendment 2 to Priorities Regulation 11, Production Requirements Plan Changes occur in paragraphs (d) and (e), which treat with restrictions on PRP Units and Interim Procedure for Class 1 Producers. The new PRP law became effective July 1.

Amendment to Priorities Regulation No. 3. This amendment establishes a uniform method of application and extensions of preference ratings.

Pay for themselves in three months

That's what is expected of two Warren Stock Pumps, which in conjunction with other equipment, are being used in the recovery of rag fiber from white water at a thrifty New England mill noted for the excellence of its product. The installation represents an expenditure of approximately one thousand dollars. Three months are not yet up but it is confidently anticipated from operations to date that the entire investment will be liquidated within this period.

Perhaps you have a mill setup in which a similar saving could be made?

WARREN STEAM PUMP COMPANY, INC.
WARREN, MASSACHUSETTS

YES, THAT CONVEYOR IS SHUT DOWN AGAIN— SO WHAT!

"PLENTY," I SAID, "REX HAS THE CURE FOR IT!"

① **"IT'S REX DUROBAR!** Here's a chain belt that's sturdy as a tank—a combination of high carbon steel sidebars and cast block links, ideal for exposed service or, in sliding over unlubricated runways, as on that conveyor of yours."

② **"SEE THAT ECCENTRIC BARREL** on Rex Durobar? Outer faces of both barrels are reinforced by extra metal that keeps the inside of the block link out of contact with the sprockets. This eliminates destructive grinding action."

③ **"SAY, THAT IS SOMETHING,"** he said —with interest. "And you say this is a good chain belt for long, center-to-center distances, too? That's my problem here: if it's the chain belt you say it is, I'd better look into it."

④ **"I THINK YOU SHOULD,** too," I said. "Rex Durobar's background of use throughout plants like yours is extremely wide and I have yet to see an installation of Durobar that didn't justify itself through far lower operating costs."

⑤ **"AND WHILE YOU'RE AT IT,** take a look at this new barking drum chain belt. I think you'll agree that it's one of the most unique conveyor chain belts in the business. It's designed by Rex engineers who grew up with your industry."

⑥ **"DUROBAR AND THIS NEW BARKING** drum chain belt are only two of several special Rex pulp mill chain belts. You can trust them with your most difficult drive and conveyor problems and be sure of coming out on top."

Naturally, these days, the delivery of orders bearing highest priority distinction takes precedence above all others. However, the Rex man will be glad to answer any and all of your inquiries and to let you know of earliest delivery dates. Address 1717 W. Bruce St., Milwaukee, Wis.

REX CHAIN BELTS

CHAIN BELT COMPANY OF MILWAUKEE

Baldwin-Duckworth Chain Belt Division, Springfield, Massachusetts • Worcester, Massachusetts
Rex Chain Belt and Conveyor Divisions, Milwaukee, Wisconsin

REX CHAIN BELT COMPANY

ALLIED

MERIT AWARDS ARE GIVEN TO 3 ATKINS EMPLOYEES

The Atkins Merit Award of E. C. Atkins and Company, Indianapolis, Indiana, was recently presented to three men in recognition of outstanding ability and significant service. The awards, consisting of diamond-studded lapel pins and plaques, were presented by Elias C. Atkins, vice president, to W. R. Chapin, Frank McCartney, and C. A. Newport.

Mr. Chapin, director of Atkins metallurgical research, has received many other awards for his important contributions to metallurgical science. He has received the Albert Saveuer Award presented by the American Society for Metals for his work in the heat treating of large size flat steels, and more recently he was honored by the American Inventors Society for metallurgical achievements in the development of steel cement.

Mr. McCartney, night superintendent of the hardening shop and an Atkins employee for 40 years, received the award for saving a fellow worker's life.

Mr. Newport, who has just completed 56 years of service with the company, was given the award for his civic and social welfare activities for the company and the city. He has been supervisor of the handsaw department and is now permanent secretary of the Atkins Pioneer Club.

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WESTINGHOUSE EXCHANGES IDEAS

The Westinghouse Electric and Manufacturing Company, East Pittsburgh, Pennsylvania, recently disclosed to newspaper writers and leading technical magazine editors more than a score of new engineering developments and ideas to help speed production in almost any war industry. Devices demonstrated at the meeting at the Aster Hotel, New York City, ranged from a simple screw driver-like cotter pin spreader that any factory worker can use, to one requiring elaborate laboratory equipment and skilled technicians for determining by photo-e'asticity the stresses on huge bolts in turbines.

"We believe this demonstration illustrates the willingness of many big companies to share their specialized 'know how' with all American industry during this national emergency," said Dr. A. A. Bates, who directs chemical and metallurgical work at the company's research laboratories, where many of the technical advances were discovered.

"The real problem," he continued, "is to provide some means for the common interchange among industries of such ingenious discoveries and new techniques, so they can be put to use in the thousands of small factories which are working day and night on war production. It is our hope that many of these small plants particularly will find these technical advances helpful."

E. C. Atkins (left), vice president of E. C. Atkins and Company, presents Merit Awards to (L to R): W. R. Chapin, director metallurgical research; Frank McCartney, superintendent hardening shop; and C. A. Newport, permanent secretary of the Atkins Pioneer Club.

◆

▶▶▶ A NEW BOOK "Protective and Decorative Coatings," contains a section by Francis J. Licata, chief chemist of the Metasap Chemical Company, a subsidiary of National Oil Products Company, Harrison, New Jersey, describing in detail metallic

Farrel-Birmingham Adopts War Production Slogan. In a contest recently conducted in the Ansonia and Derby plants of Farrel-Birmingham Company, Inc., the judges selected as a wartime slogan for these two plants, "Farrel Drives for Victory." Jeanette Larson, office secretary who submitted the slogan, is shown.

LONGER LIFE

For Equipment!

Cut Maintenance Costs—Use Industrial Chromium Plating

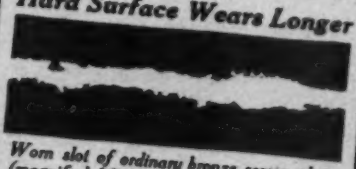
CRODON's exceptionally efficient protection against wear and corrosion insures substantial savings in your maintenance costs. Because chromium is the hardest commercial metal and completely non-corrosive, CRODON-plating prolongs the normal life of your equipment and reduces expenses incurred by frequent replacements, operating delays and interrupted production.

CRODON-plated equipment also insures better-quality products. More precise, better-defined results and more perfect finish are obtainable, due to CRODON-plating's unusually smooth, hard, easily cleaned surface. It also offers remarkable freedom from product contamination. Its new-equipment performance endures for surprisingly long periods.

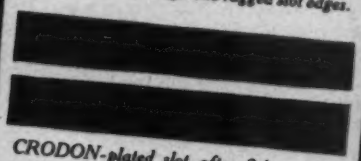
Look for the trademark CRODON — it assures you of the best in chromium plate. It guarantees top quality applied in the most practical, economical way —for behind every CRODON application are the expert knowledge, experience and resources of America's largest and oldest industrial chromium plating organization.

Let us show how CRODON-plating can help you solve your maintenance and cost problems.

Hard Surface Wears Longer

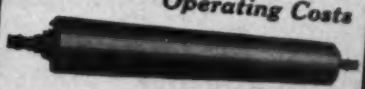


Worn slot of ordinary bronze screen plate (magnified 10 diameters) after 10 months' service, showing rough and ragged slot edges.



CRODON-plated slot after 24 months' service. Note permanent slot accuracy, absence of wear and smoothness of slot edges.

Corrosion Resistance Cuts Operating Costs



Steel couch roll, 116 inches long — 20 inches diameter, CRODON-plated to resist corrosion.

Smoothness Insures Better Quality Product

CRODON-plated twin drum drier. The dried material is removed so easily from the glass-like surface that power consumption is greatly reduced and scraper knives last many times longer.

CRODON PLATING pays

CHROMIUM PLATING

CHROMIUM CORPORATION OF AMERICA

Executive Offices . . . 120 Broadway, New York

346 Huntingdon Avenue — 1730 Lakeview Road — 4645 West Chicago Avenue

soaps in the protective-coatings industry. This book, of special interest to manufacturers of artists' pigments, and makers of industrial finishes, contains special chapters dealing with methods of testing, the manufacture of, and solubility of metallic soaps.

◆

NOPCO HONORS 38 EMPLOYEES NOW IN THE ARMED FORCES

Six hundred officers and employees of the National Oil Products Company gathered in the yard at the Harrison (New Jersey) plant to participate in patriotic ceremonies honoring 38 former employees now serving in the armed forces. Simultaneously, the U. S. Treasury Department's Minute Man Flag of Merit, denoting more than 90 per cent participation in the War Bond drive, was presented and raised over the plant.

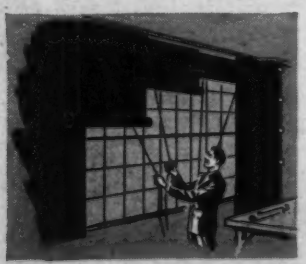
During the ceremonies a large plaque bearing the names of the 38 former employees was unveiled and presented by Robert A. Wetherhold, president of the NOPCO A. A., employee organization at the plant, to Charles P. Gulick, company president and chairman of the board. Mr. Gulick promised the scroll would occupy a prominent place at the plant so that all present and future members of the company might see it.

◆

NEW BLACKOUT BLIND—MADE OF CREPE FIBER

A new type of industrial blackout blind has recently been developed by Clopay, Cincinnati, Ohio, and has already been installed in some coastal plants and government buildings.

This blind is of the cord type, which raises and lowers easily, and by a practical method of overlapping is adaptable for windows of any size or number in factories, hospitals, and



public buildings. It is made of heavy crepe fiber, material which is not only completely light-proof, but will remain so. It will not pinhole, and there is nothing to crack or peel off. Also, the blinds are chemically treated to make them incapable of supporting combustion. Unless immersed in liquid, or after long severe exposure, they will not flame even in direct contact with fire.

Original installation costs are about the same as paint, which, of course, becomes ineffective the minute glass is broken and offers no protection against flying glass, cause of over 70 per cent of the casualties from bombing in England.

Raising "Minute Man Flag" at NOPCO'S Victory Day ceremonies. L to R: Mayor Frederick Gassert, of Harrison, New Jersey; Eugene A. Riordan, representing the U. S. Treasury Department; and Charles P. Gulick, president of National Oil Products Company.

◆

LOBDELL CO. NEW NAME OF LOBDELL CAR WHEEL CO.

Since the Lobdell Car Wheel Company of Wilmington, Delaware, is no longer manufacturing freight car wheels, the stockholders of the company have voted to change the name of the firm to the Lobdell Company. The plant is now devoted almost entirely to the production of machine tools and paper mill machinery.

The company has changed its name several times during its long history. Founded in 1836 under the name of Bonney and Bush, it became Bush and Lobdell in 1855. In 1867, George G. Lobdell, Sr., father of George G. Lobdell, Jr., who passed away June 7 (See Necrology), incorporated the firm under the name of Lobdell Car Wheel, Tire and Machinery Company. In 1871, the name was shortened to Lobdell Car Wheel Company.

N. Y. RANGER SCHOOL STARTS WAR COURSE

In connection with the U. S. Engineering Science and Management Defense Training Program, a 14-week course was started June 30 at the New York State Ranger School, Wanakena, New York.

Nineteen students started in the course which covers training in plane and topographic surveying and topographic drafting. The object of the course is to train men from 17 to 19 years of age preparatory to defense work and before being selected for service in the armed forces.

Syracuse University is sponsoring the course which is conducted by James F. Dubuar, director of the Ranger School, a branch of the New York State College of Forestry at Syracuse.

◆

ALLIS-CHALMERS 100% NAVY PLANT IN PRODUCTION

A new plant for the production of 100 per cent Navy material was recently put in operation at the Allis-Chalmers Manufacturing Company, Milwaukee, Wisconsin. This is the second big Allis-Chalmers war production unit to begin operating within the month.

Practically a self-contained shop, the emergency building, covering an area of 200,000 ft., is of wood con-

There are

NO PRIORITIES

...on TITANOX *technical service!*

RESTRICTIONS on the use of some raw materials in addition to limited supplies of others, create a situation for the paper manufacturer which necessitates revamping certain formulas to meet the new conditions.

In this emergency the information which TITANOX research has evolved in its intensive study of white pigments in relation to paper manufacturing takes on increased importance. Those studies continue without abatement and the knowledge resulting from them is available.

The best efforts of TITANOX technical service are being directed toward maintaining the high quality of paper products in which TITANOX pigments are employed. Why not let it help you with your problems?

✓ OPACITY
✓ WHITENESS
✓ BRIGHTNESS

TITANIUM PIGMENT CORPORATION
SOLE SALES AGENT

111 Broadway, New York, N. Y. • 104 South Michigan Avenue, Chicago, Illinois • 350 Townsend St., San Francisco, Cal. • 2472 Enterprise St., Los Angeles, Cal.

TITANOX
TRADE MARK

struction with brick facing. The wood construction was adopted both to cut construction time to a minimum, just 90 days, and to conserve critical materials. Practically the only metal used is in the metal caps at the ends of timber tresses and columns, and these caps were produced in Allis-Chalmers' own foundry to save time.

Electrical control equipment will be manufactured in the new building, and employees engaged in production will include several hundred women.

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▶▶▶ A SUBSTANTIAL INCREASE of industrial expansion on the West Coast during the last eighteen months to meet war requirements has caused The Swartwout Company, Cleveland, Ohio, to organize The Swartwout Pacific Company, San Francisco, California, with complete facilities for manufacturing the industrial roof ventilators in the Swartwout line.

◆

▶▶▶ A LARGE PROGRAM OF EXPANSION, including plant and production facilities, is being completed by the Keystone Carbon Company, St. Marys, Pennsylvania. This project was necessary because of the increased demand for materials produced by powder metallurgy by which Keystone makes metal-graphite, carbon and graphite brushes, etc.

◆

U. S. STONEWARE PURCHASES LOWER RUBBER MFG. CO.

The business and mechanical rubber goods factory of the Lower Rubber Manufacturing Company at Ravenna, Ohio, has just been purchased by the Chamberlain Engineering, Ltd., a unit of The United States Stoneware Company, Akron, Ohio.

The technical facilities and sales organizations of the two companies will be merged. M. S. Lower, former president of the Lower Rubber Manufacturing Company, will serve as general manager of the plant, which will be operated as the Lower Rubber Manufacturing Division.

Built in 1938, this plant is thoroughly modern, and will be used principally for milling, calendering, extruding, and molding operations on the "TYGON" series of synthetic rubber-like materials. However, provision will be made for the production of U. S. Stoneware's "DURALON," as well as for the retention of the varied mechanical rubber goods line of the former Lower company, and new rubber items for war agencies.

▶▶▶ THE 22ND FLOOR of the Civic Opera Building, Chicago, is the new location of the offices of the Carrier Corporation, Syracuse, New York. Arthur S. Shanklin, recently elected vice president in charge of the Central District, has moved from Philadelphia, Pennsylvania, and taken up his new duties in Chicago.

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KIDDER PRESS CO. DISCONTINUES ITS AGENCY BUSINESS

The Kidder Press Company, Dover, New Hampshire, and its predecessors, who have served as agents for the Chapman Electric Neutralizer Company, Portland, Maine, in sales and installations of the Chapman static neutralizer, have retired from the agency business. As of June 1, 1942, the Chapman company began serving the trade directly, and will maintain installation service, employing the Chapman neutralizer installation engineers from the Kidder Press Company. Merle S. Pennell, sales engineer, has reassumed his responsibilities directly with the company.

Today, throughout the United States and Canada, more than 16,000 Chapman static neutralizers are helping industry maintain increasing production schedules by neutralizing static electricity developed in manufacturing operations.

S A F E T Y

SUTHERLAND CO. EMPLOYEE WINS N.S.C. CITATION

A National Safety Council citation was awarded Maurice Goodwin at a banquet in the Columbia Hotel, Kalamazoo, Michigan, on June 26. An employee of the Sutherland Paper Company, Kalamazoo, Mr. Goodwin has driven 502,500 miles for the company in the past 25 years with no accidents, an all-time record, according to the National Safety Council.

In the principal address, Louis W. Sutherland, chairman of the board, recalled that Mr. Goodwin began work with Sutherland as a push-cart operator. Glen Graham, vice president of Sutherland, presented the citation to him.

Clarence Kaiser and Claude Glidden, Sutherland drivers, received awards for having driven trucks for 1 year without an accident.

◆

▶▶▶ IN AN ACCIDENT of undetermined origin on July 3 at the South Brewer (Maine) mill of Eastern Corporation, one man was fatally injured and two others severely burned, when pulp from a digester was accidentally discharged into the digester room where several men were working.

The Paper Industry Safety Scores

July 1, 1941 to June 30, 1942

Out of 191 mills reporting for May, 10 have perfect record

PERFECT SCORES
Division I—Pulp and Paper Mills

PARTICIPANT	MILL	LOCATION
GROUP A		
GROUP B		
St. Croix Paper Co.	Woodland	Maine
GROUP C		
American Writing Paper Corp.	Parsons Div.	Holyoke, Mass.
The Mead Corporation	Harriman Div.	Harriman, Tenn.
Marathon Paper Mills Co.	Ashland	Wisconsin
GROUP D		
*U. S. Gypsum Company	North Kansas City	Missouri
Spaulding Fibre Co., Inc.	Milton	New Hampshire
Spaulding Fibre Co., Inc.	Hayes	New Hampshire
Division II—Paper and Board Re-Manufacturing		
Thilmany Pulp & Paper Co.	Bag Mill	Kaukauna, Wis.
Bird and Son, Inc.	Roofing Plant	Shreveport, La.
Bay West Paper Co.	Green Bay	Wisconsin

*May report missing—covers ten months only.

HOW TO TAKE "ROAR" OUT OF DRYER SECTIONS

NOISE MEANS WEAR AND HERE'S WHAT BLACK-CLAWSON HAS DONE ABOUT IT

Dryer sections are pretty noisy pieces of machinery . . . that is, all but the new section above recently built by Black-Clawson.

Here for the first time, noise and wear have taken a licking. Spiral spur gears do it, their rolling contact entirely eliminating backlash and lost motion, sometimes a source of surprising annoyance.

These spiral gears, of course, had to be accurately centered which meant careful machining of dryer frames. Each gear runs in a totally enclosed housing with oil provided by a circulating system.

Note that this Black-Clawson first is not a frill or gadget. Cardinal principal of B-C construction is practical, enduring design with emphasis on simplicity. ***The Black-Clawson Company, Hamilton, Ohio. Shartle Division, Middletown, Ohio. Dilts Division, Fulton, New York.***

BLACK-CLAWSON

NAMES *in the* NEWS

Personals

CHIDESTER HEADS P. & P. DIV. FOREST PRODUCTS LAB.

The Forest Products Laboratory, Madison, Wisconsin, last month announced the appointment of Gardner H. Chidester as chief of the Laboratory's Division of Pulp and Paper. In this position Mr. Chidester succeeds the late C. E. Curran.

Mr. Chidester became associated with the Laboratory's Division of Pulp and Paper in 1925, having been a member of the editorial staff of *The Paper Industry*, Chicago, for about two years. After graduating from the University of Michigan in 1920, where he majored in chemical engineering, Mr. Chidester was connected with Kimberly-Clark Corporation for three years. His work at the Laboratory has been closely associated with sulphite and semichemical pulping process in-

Gardner H. Chidester

vestigations. Among his first assignments at the Laboratory was a waste survey, carried out in co-operation with a number of paper mills, which resulted in methods of reducing white-water fiber losses. Shortly after that, he began his work with semichemical pulping processes, then in the pioneer stage. He participated in the establishment of a semichemical mill for pulping of southern hardwoods, including the gums, at Hartsville, South Carolina, in 1927, where wrapping paper was produced.

The following year, Mr. Chidester began his work on the adaptation of the sulphite process to new species, and growth-quality relationships of pulpwoods. Among his contributions has been a method of recovering soda and sulphur from soda-base sulphite liquor for re-use.

The Division is now occupied with wartime research problems, including the development of substitutes from pulp and paper for critical war materials, diversification of species for pulping, and methods for improving pulp yield.

◆

▶▶▶ *Ian H. Macdonald*, general manager of the Canadian Daily Newspapers Association, has been appointed technical adviser to the publishing, printing, and allied industries administration. The administration, headed by *John Atkins*, is a branch of the control system of the Wartime Prices and Trade Board of Canada. The Board has also announced the appointment of *Frank L. Mitchell*, operating manager of the Alliance Paper Mills, Ltd., at Merritton, Ontario, as technical adviser to the pulp and paper administration.

◆

R. B. McKINNEY IS PROMOTED BY HERCULES POWDER

R. B. McKinney has been appointed assistant general manager of the Paper Makers Chemical Department of the Hercules Powder Company, Wilmington, Delaware. He has been associated with this department for the past four and a half years.

Mr. McKinney joined the Hercules organization on January 1, 1913, in charge of a branch in the accounting department, and rose to be purchasing agent of the company upon establishment of its purchasing department in 1918. Prior to his work in the Paper Makers Chemical Department, he was director of purchases for the company.

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▶▶▶ Formerly with the Champion Paper and Fiber Company, Hamilton, Ohio, *Eugene E. Rodabaugh* has accepted a position with the Crossett Lumber Company Research Laboratory, Crossett, Arkansas, where he will work in the pulp and paper division.

▶▶▶ Associated with The Bristol Company, Waterbury, Connecticut, as physicist for past several years, *Charles A. Mabey* has been appointed director of the research activities of the company. A Harvard graduate, Mr. Mabey has done advanced work in physics at both Harvard and Massachusetts Insti-

Charles A. Mabey

tute of Technology. He has also been associated in research work with International Communications Laboratories of New York City, Federal Telegraph Company of Newark, New Jersey, and Mathieson Alkali Works of New York City, and is a member of the American Physical Society.

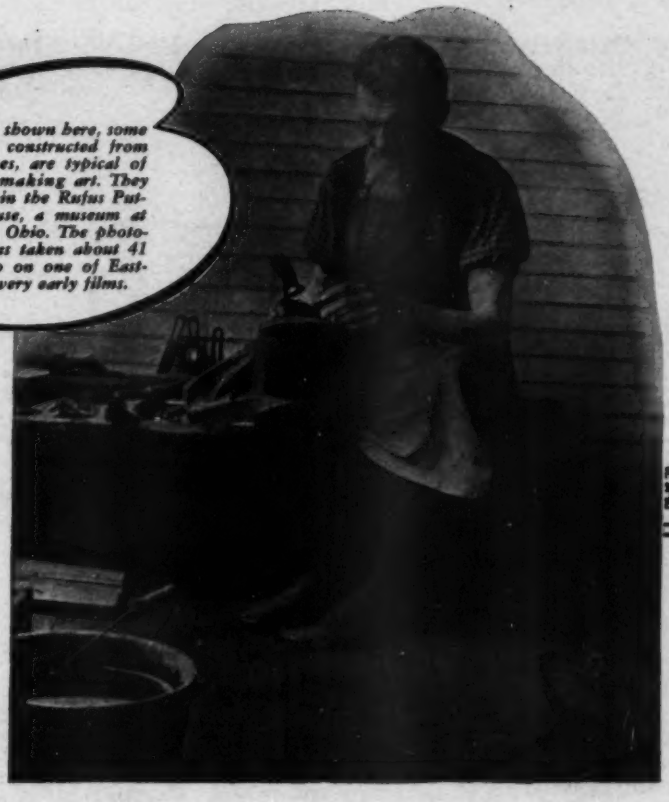
◆

▶▶▶ Associated with The B. F. Goodrich Company of Akron, Ohio, for the past 35 years, *V. I. Montenyohl* has resigned because of ill health. Mr. Montenyohl joined the company in 1907 as a stenographer in the credit department. He was made assistant treasurer in 1920, treasurer in 1927, and vice president in 1940, serving in this capacity until his resignation.

◆

FRANK HOLBROOK RETIRES AS MGR. OXFORD MIAMI

Frank E. Holbrook has retired as mill manager of the Oxford Miami Paper Company, West Carrollton, Ohio, which position he has held since 1929. He will continue, however, as a director of the company and will act in an advisory capacity to the board



The tools shown here, some of them constructed from deer bones, are typical of the shoemaking art. They are now in the Rufus Putnam House, a museum at Marietta, Ohio. The photograph was taken about 41 years ago on one of Eastman's very early films.

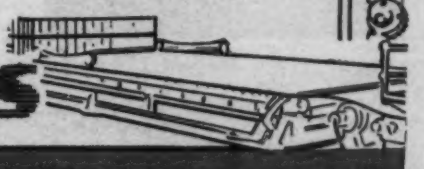
"So..He Was a SHOEMAKER, eh?"

Some of you remember him . . . If you were a favored customer, you were allowed to wait 45 minutes while he sewed on a pair of soles. He wet and pounded the leather, presumably to increase density and wear. He awled holes all around near the edge. By some miracle he got his double thread through every one of them, drawing it taut each time and knotting the ends. He tacked the sole across the base. He trimmed off the surplus, inked the edges, burnished them, and—there you were!

So . . . *"he was a shoemaker,"* eh? That depends. If the term would deride his labors, NO!!! If by it you mean to praise his handiwork, YES.

Here at Lindsay we take off our hats to the earnestness of the old hand cobbler. We envy him his patience. We respect his thoroughness. We even admire some of the results he achieved. Adding to the same spirit of craftsmanship the speed and finesse of modern machinery, we propose to go on giving you the very best Fourdrinier wires we know how to produce.

THE LINDSAY WIRE WEAVING COMPANY
14001-14299 Aspinwall Avenue • Cleveland, Ohio



Lindsay WIRES
FOR PAPER MILLS

of directors. Don C. Appleton, who has been assistant mill manager for the past 5 years, has been named manager.

Mr. Holbrook's retirement completes a period of 45 years activity in the industry. He entered the business with the Kimberly-Clark Corporation at Appleton, Wisconsin, and in 1900 went with the Great Northern Paper Company at Madison, Wisconsin. He later became superintendent of the Great Northern Paper Company's mill at Millinocket, Maine. After that he became assistant manager of manufacturing of the International Paper Company; in 1921, general manager of the Combined Locks Paper Company at Appleton; and in 1929, manager of the West Carrollton plant, a subsidiary of the Oxford Paper Company.

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▶▶▶ Employees of two large paper companies in western North Carolina have been elected officers of the Western North Carolina Engineers Club. *Ray Bennet,* of the Ecusta Paper Corporation of Pisgah Forest, was made president; and *J. R. Sechrest,* of the Champion Paper and Fibre Company of Canton, was elected secretary.

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▶▶▶ Southeastern sales manager for Acme Steel Company, Atlanta, Georgia, Frank H. Webb has announced the transfer of *K. J. Pedersen* to Charlotte, North Carolina, to handle sales in North and South Carolina. This

K. J. Pedersen

appointment was necessitated by the passing of F. G. German and the induction of G. R. Easley into the Army. Mr. Pedersen will maintain headquarters at 2243 Selwyn Avenue, Charlotte, North Carolina.

▶▶▶ The Mixing Equipment Company of Rochester, New York, has appointed *Robert E. Mason* of Charlotte, North Carolina, as the company's representative for the states of North and South Carolina. He will handle the "LIGHTNIN" propeller

Robert E. Mason

and turbine type mixers. Mr. Mason is a graduate in electrical engineering from the University of North Carolina, and has spent more than ten years in sales engineering in the electrical and process equipment field.

◆

▶▶▶ President of American Cyanamid & Chemical Corporation, New York City, *H. L. Derby* was elected president of the Manufacturing Chemists Association, succeeding Lammot du Pont, chairman of E. I. du Pont de Nemours & Company, Wilmington, Delaware, who was named chairman of the executive committee. The election was held at the Association's 70th annual meeting at the Waldorf-Astoria Hotel, New York City, on June 4.

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▶▶▶ *W. J. Damtoft,* assistant secretary of the Champion Paper and Fibre Company, Canton, North Carolina, has been appointed chairman of North Carolina's seventh district selective service board of appeals.

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▶▶▶ Formerly associated with the North American Rayon Corporation, Elizabethton, Tennessee, *Samuel A. Woodruff* has been named a research engineer on the technical staff of Battelle Memorial Institute, Columbus, Ohio, and has been assigned to the division of organic chemistry. Mr. Woodruff is a graduate of the University of Idaho and of the University of Wisconsin.

▶▶▶ Director of the budget of Hammermill Paper Company, Erie, Pennsylvania, *John H. DeVitt* has been elected first vice president of the National Association of Cost Accountants. The election was held at the Palmer House in June in connection with the 23rd International Cost Conference. Mr. DeVitt has served as director of the Association for the past six years.

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▶▶▶ Vice president of the St. Regis Paper Company, New York City, *E. R. Gay* has resigned his position to become special adviser to the Division of Civilian Supply of the War Production Board.

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▶▶▶ Having completed his work with the Pulp and Paper Branch of the War Production Board in Washington, *Donald K. Leslie* has returned to his duties as executive vice president of the Hammermill Paper Company, Erie, Pennsylvania.

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▶▶▶ Sales manager of Greene, Tweed & Company, New York City, for many years, *Frank J. Hill* has recently been elected vice president. Mr. Hill has been connected with the company since 1915.

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▶▶▶ Associated with The B. F. Goodrich Company, Akron, Ohio, for the past 23 years, *Dr. Harlan L. Trumbull* has been selected to head the company's new project to study

Dr. Harlan L. Trumbull

new sources of rubber. Dr. Trumbull is a graduate of the University of Washington and Chicago University, and until his new assignment he had been manager of the company's chemical research department since 1922.

Supplement Government Controls

OPERATING UNDER GOVERNMENT CONTROLS, the paper industry must utilize its available tonnage of wood pulp, its man-power and its equipment at greatest attainable efficiency. Machines must be maintained in first class condition, properly adjusted and clothed. Down time must be minimized; speeds must be consistent; broke must be prevented.

These requirements account, in large measure, for the greatly increased demand for Hamilton Felts. Hamilton Felts supplement governmental controls. Into their manufacture goes more than eighty years experience. This experience controls every operation from the selection, cleaning, weighing, carding and blending the wools to the fulling and finishing of the completed felts. Consequently Hamilton Felts remove more water faster. They reduce the load upon the driers, save steam, prevent broke and permit continuous, high-speed operation of the paper machines.

From the thinnest tissue to the heaviest board there is a Hamilton Felt that will do your work better, faster and at lower cost.

SHULER & BENNINGHOFEN, HAMILTON, OHIO

• Miami Woolen Mills •

Hamilton Felts

• Established 1858 •

INSTITUTE HAS NEW ASSISTANT DEAN

Dr. Westbrook Steele, executive director of The Institute of Paper Chemistry, Appleton, Wisconsin, has just announced the appointment of Dr. J. Edward Todd as assistant to the dean, Harry F. Lewis, as of July 1, 1942. Dr. Todd comes to the Institute with a very interesting background and with much practical experience in education and college administration. He is also not a stranger to the Middle West, having spent about 15 years at Cornell and Carleton Colleges.

Dr. Todd received his A. B. degree at the University of Kansas in 1918, his M. A. degree in 1934 and his Ph. D. degree in 1940, both from Teachers College of Columbia University. In his senior year at college, he enlisted in the Air Service and his squadron was about to sail for France when the Armistice was signed. Wishing to have some part in the reconstruction program, he volunteered for Near East Relief and spent 1919 in Constantinople (now Istanbul) and the Russian Caucasus, where he was responsible for the transportation of relief supplies to the interior stations of the Caucasus area. On his way back to America, he served three months in Constantinople as cashier to the Treasurer of the American Board of Foreign Missions. After spending two years at the University of Vermont, he returned to Constantinople as Bursar of Robert College, an American college which had an enrollment of about 800 students of all nationalities and a budget of about $350,000. Although he was compelled to return to the States the following year, he retained his interest in the College and in 1927-1928 assisted the Near East College Association in raising a $5,000,000 fund.

From 1923 to 1927 Dr. Todd was business officer of Cornell College, Mount Vernon, Iowa; in this capacity he was responsible for the management of investments under the direction of the Loan Committee of the board and for the management of the physical plant and the operation of the residence and dining halls. From 1928 to 1937 Todd was at Carleton College, where he was director of admissions and secretary of personal service and assistant professor of psychology and education; from 1937 to 1941, he occupied similar positions at Springfield College, the change being made that he might be nearer has graduate studies.

Dr. Todd's interests in higher education administration, psychology and philosophy are reflected in his membership in the American Psychological Association, Mid-West Psychological Association, Eastern Psychological Association, American College Personnel Association, Eastern College Personnel Officers Association, American Association for the Advancement of Science, Minnesota Academy of Science, etc. He is also a member of Kappa Delta Pi and Phi Delta Kappa. He has also served on several committees of the National Council of the Y. M. C. A.

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BERGMANN CHIEF ENGINEER FOR LINK-BELT

Richard F. Bergmann has been appointed chief engineer of the Link-Belt Company, Chicago. He will succeed William W. Sayers, chief engineer since 1925, who has been appointed to the company's newly created position of consulting engineer. In his new duties, Mr. Sayers will continue to deal with patent matters and be available for consultation.

W. W. Sayers

R. F. Bergmann

Mr. Bergmann had been assistant to Mr. Sayers from 1933 to 1936, when he resigned to become chief engineer of Rayon Machinery Corporation, Cleveland, Ohio, from which position he now returns to Link-Belt.

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PEPPER, TREAS. OF SCOTT PAPER CO. IN NAVAL RESERVE

G. Willing Pepper, treasurer of Scott Paper Company, Chester, Pennsylvania, since January 8, 1940, resigned as of February 13, 1942, and is now serving in the United States Naval Reserve as a Senior Lieutenant. He will, however, continue on leave of absence as a member of the board of directors.

William R. Scott, 3rd, was elected to succeed Mr. Pepper. He will also continue his duties as secretary of the company and head of the Legal Department. C. E. Ireland, a graduate of the Wharton School of Finance, became assistant treasurer on April 1. Mr. Ireland has been with the company for ten years.

To date, 181 employees of the company have joined some branch of the armed forces. These men have all been given the standard company military leave of absence and received from one to four weeks' leave pay, depending on their length of service.

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FOREST PRODS. LAB. HAS NINE MEN IN SERVICE

Four more members of the technical staff of the Forest Products Laboratory, Madison, Wisconsin, have entered active service in the armed forces. They are Major Don Brouse and Lieutenant Theodore J. Martin, engineers engaged in research work in glues, gluing and plywood manufacture; Captain Allan D. Freas, an engineer engaged in research on plywood strength; and Captain John P. Hohf, a chemist engaged in developing wood plastics.

This makes a total of nine staff men thus far called into service. All but three of them held commissions as reserve officers.

Necrology

GEO. G. LOBDELL, JR.

George G. Lobdell, Jr., 91, passed away on June 7. He was the retired president of the Lobdell Car Wheel Company of Wilmington, Delaware, which has recently been renamed the Lobdell Company (See Allied).

Graduated from Yale University in 1871, the next year, Mr. Lobdell followed his brother, the late William Lobdell, in the business which was formerly headed by his father, the late George G. Lobdell, Sr. He entered the firm as a chemist, and after serving as secretary, treasurer, and vice president, was made president in 1914. He held this office until his retirement in May, 1941.

Surviving are two daughters.

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CHARLES G. STRONG

Charles G. Strong, an engineer for the Hammermill Paper Company, Erie, Pennsylvania, passed away on June 19. Born in Sweden, he came to the United States at the age of 4. He was associated with the paper company for the past 25 years.

Mr. Strong was 81 years of age. He is survived by his widow, six daughters, and a son.

A PAIR OF IRON BODY VALVES FOR CONTINUOUS SERVICE

Fig. 1640 I.B.B.M.
"KING-CLIP" GATE
(Non-ferrous stem-thread bushing cast in the bonnet)

Fig. 1644 All-Iron
"KING-CLIP" GATE
(Coarse integral stem-thread in bonnet with large clearance)

On lines where uninterrupted service is essential—which means *all lines* in these critical times—you'll do well to use these two sturdy Lunkenheimer valves.

They are built to stand up under rough, hard usage—to stay tight and to give the added long service life so necessary now when replacement time is so important.

You can use them to advantage in the many places where small gate valves are used. Fig. 1640 has wide application on steam, oil, gas, water and gasoline lines and Fig. 1644 on many corrosive lines.

Once installed, these quality valves will do their part well.

ESTABLISHED 1862
THE LUNKENHEIMER CO.
"QUALITY"
CINCINNATI, OHIO, U. S. A.
NEW YORK CHICAGO
BOSTON PHILADELPHIA
EXPORT DEPT. 318-322 HUDSON ST., NEW YORK

Since virtually all materials used in the manufacture of valves are on the list of critical materials, valve users are urged to furnish the highest possible preference ratings on their orders. This will be of mutual helpfulness.

LUNKENHEIMER VALVES

Maintenance and Conservation Forum

Paper Machine Maintenance

(Compiled by Maintenance of Paper Machines Committee. Chairman—V. S. Denison, Beloit Iron Works.)

Don't Be a Dirty Housekeeper—Keep all parts clean and well painted, using proper kind of paint on well prepared surfaces thus reducing corrosion of metals.

Don't Work in the Dark—Keep windows clean, provide ample illumination both day and night. White painted interiors of machine room help.

Don't Be Awkward—Provide for and see that workmen use proper tools. A pipe wrench was not made for bolts and a hammer not made to open pipe unions.

Don't Wait for Shut-downs—Make repairs and adjustments immediately, especially those that may cause breakage or fast wear until corrected.

Don't Expect Machine Parts to Be Flexible—Check all indrive shafts for alignment, especially where flexible type couplings are used. These may be ruined.

Don't Catch Chains on Journals or in Press Nips—Use care with crane or hoist chains over paper machine especially if machine is turning over. See that pull chain guards are properly adjusted. Use ropes for lifting loads wherever possible.

Don't Say "Good Enough"—For each roll requiring a doctor there is a proper type of blade and mounting. Do check alignment, angle, weight, etc.

Don't Use Them for a Crow-bar—On non-removable types of Fourdriniers do use greater care handling table rolls, straighten and balance those running out of true. Keep them turning.

Don't Use Them for a Brake—See that collar straps and stuffing boxes on cylinder molds do not bind; this is severe punishment to mold faces.

Don't Have Shoulders—Keep all rolls on the wire clean of limed-up stock just outside the wire's usual running width, especially the suction couch. These increased diameters can cause slack edge wire should it travel over here.

Don't Allow Internal Parts to Become Stopped Up With Muck—Suction rolls are concentrated value and should be cleaned and inspected at least once a year. Back washing is recommended. Your manufacturer will give you a print of this set-up.

Don't Forget He Has Learned Something Too—Consult your manufacturer about rubber rolls, their density, type of doctor, care, etc. If stored, keep in dark cool place. Rotate occasionally.

Don't Invite Cracking—If granite rolls are removed from machine, store lying flat. Keep damp and away from heat. Turn occasionally.

Don't Be Careless With Weighing—Examine often lever weight arms and fulcrum pins. They should not bind. Keep all weight levers horizontal when carrying full load. See that all turnbuckles rotate freely.

Don't Be Deaf, Dumb and Blind—It takes your eyes, ears, sense of smell and touch to detect trouble around machinery.

Don't Build or Box Under Them to Catch Them When They Fall—Replace worn felt and wire roll journals before they break. It will save a wire or felt. Use as few felt or wire rolls as possible.

Don't Punish Felts and Rolls—Use care not to allow bunches of stock to go through a press. The felt may take it but rubber covered rolls take a serious jolt, especially serious with rubber covered suction press rolls.

Don't Use Worn-out Carrier Rope for Sling to Lift Loads—Check alignment of rope carrying sheaves. Severe rubbing of flanges is unnecessary wear on ropes.

Don't Start Too Fast—At all times use care in striking in clutches, especially after weekly shutdown. Keep clutches properly adjusted.

Don't Run Thin Tooth Gears—Replace worn dryer gears and pinions. One broken tooth may cause a serious shutdown.

Don't Run Dirty Dryers—Dryers if kept clean and polished pay dividends in less steam consumption and better finished paper. Wet end dryer doctors are valuable.

Don't Burn the Mill Down—Be careful when using a torch for cutting or welding. If done in critical location, lay out hose or fire extinguisher in advance; especially is back side of machine dryers a likely place for a fire.

Don't Let Them Blow—Keep steam siphon pipes and joints on dryer in repair. Modern balanced steam fits will stay tight at higher pressures and reduce horsepower to drive machine.

Don't Send a Boy to Do a Man's Job—Have a competent careful man to constantly inspect and check paper machines. His worth is to anticipate mechanical troubles before they develop. Consult your machine builder often.

Sound business practice and common sense dictate that a paper machine should be well cared for. If it is not properly cared for, the answer is just plain carelessness and neglect. Neglect by management so see that carelessness is eliminated.

Much data is available regarding lubrication and advice and consultation by those who are trained along this line are at the disposal of all mills for the asking.

A clean, well-lighted machine room will expose minor mechanical troubles as they may develop, whereas if it is dark and dirty, who knows what is going on until real trouble develops.

Keeping machine parts well-painted prevents rust corrosion and failure of parts, especially is this true of the wet end sections. In painting, surfaces should be well prepared by scraping, wire brushing or sanding. They should be dry and clean. Painting pays dividends not only retarding deterioration but helping to maintain a cleaner product. Again consultation and expert advice are yours for the asking by the manufacturers.

In any maintenance or upkeep job, proper tools are a necessity. Good wrenches and hand tools will save destruction of many small but vital parts, especially those that need periodic adjustment. The mill management should provide all unusual or special tools. Above all, provide a place for workmen's tool kits and all special tools as they have no value unless they are quickly available.

Make repairs and adjustments immediately, especially those that may cause breakage or fast wear. In some cases it may necessitate shutting down the paper machine but some vital, perhaps some quickly un-replaceable part may be saved, or a serious breakdown prevented.

On the older types of machine back drives, keep the bearing bolts tight. If the mortise gear has some fat teeth, work them down so that they run more smoothly. Modern spiral bevel or hypoid drive stands of course always run smoothly. They are self-lubricated, clean and require less power.

On indrive shafts to the various sections, alignment is very often neglected; particularly does this become dangerous where ball or roller bearings and flexible couplings are involved. It may destroy both. Smooth running back drives help materially in preventing corrugating of rubber rolls and will give more running hours between grinding periods.

Many rolls on paper machines require doctors; some of these doctors may be of simple construction but in many places mountings of the flexible type are very much to be preferred. Flexibly mounted doctor blades are somewhat easier on roll surfaces and on the whole, all doctors should be oscillated. The mounting, alignment, angle, weight and blade wear should be checked often. Do not allow a doctor to chatter and always watch the blade wear.

This is the first installment of the Maintenance and Conservation data presented at the annual meeting of **The American Pulp and Paper Mill Superintendents Association,** Grand Rapids, Michigan, June 16-18, 1942. Succeeding installments will appear in this section each month until completed. (See Page 386 for panel personnel.)

$5,223.24 to Draw a Picture of Color

THE intricate mechanism shown here—a spectrophotometer—automatically draws a picture of the exact color of any paper sample or paper-making material.

This is just one example of the complex instruments and special equipment Hercules employs to maintain uniform high-quality in the chemicals produced for paper makers. Hercules' facilities of this kind are far more extensive than an individual paper maker would be justified in acquiring, but these facilities, as well as the high quality products they make possible, are available to users of Hercules paper-making chemicals.

PAPER MAKERS CHEMICAL DEPARTMENT

HERCULES POWDER COMPANY
INCORPORATED

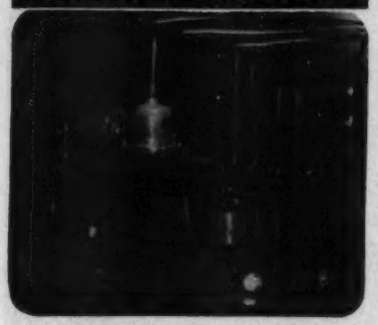
WILMINGTON, DELAWARE

SUPERIOR PMC CHEMICALS

ALBANY, N. Y.
ATLANTA, GA.
CHICAGO, ILL.
HOLYOKE, MASS.
JACKSONVILLE, FLA.
KALAMAZOO, MICH.
MARRERO, LA.
MILWAUKEE, WIS.
NEW YORK, N. Y.
PENSACOLA, FLA.
PORTLAND, ORE.
SAN FRANCISCO, CALIF.
SAVANNAH, GA.
STONEHAM, MASS.
FREEMAN, ONT., CANADA
ERITH, ENGLAND

PM-78

Simple, Easy Control of SHEET MOISTURE CONTENT



A New Kind of

PRESSURE REGULATOR

IT PAYS to have a good pressure regulator on any paper machine, but it pays even better to have ARMSTRONG-STAMM MOISTURE CONTROL! Instead of limiting the control solely to maintenance of UNIFORM PRESSURE, the Armstrong-Stamm System actually varies the pressure to automatically produce UNIFORM SHEET MOISTURE CONTENT!

Armstrong-Stamm Moisture Control equipment is built especially and solely for paper machines. Units are designed for fully automatic operation but are also instantly responsive to manual operation at the will of the machine operator. And while units are highly sensitive to the condition of the sheet, the equipment itself is of rugged construction and is easily understood and manipulated by machine operators. All of the equipment has been thoroughly proven in typical mills and is sold on a basis of complete satisfaction guaranteed. We will be glad to send you detailed information.

Armstrong also offers complete engineering service and equipment for modernizing machine drainage systems and for applying graduated temperature control to machine dryers. Write to ARMSTRONG MACHINE WORKS, 816 Hoffman St., Three Rivers, Michigan.

ARMSTRONG

ARMSTRONG-STAMM PAPER MILL ENGINEERING DIVISION

DRYER DRAINAGE SYSTEMS
MOISTURE CONTROL SYSTEMS
GRADUATE TEMPERATURE CONTROLS
STEAM TRAPS • HUMIDIFIERS

There is a wide choice in the variety of blades with many of the special steels and copper alloys becoming increasingly hard to get. Fortunately, in many places some of the plastic or rubber compounds may be substituted and in many cases are superior.

Suction rolls in paper machines represent a concentrated value and should receive special care such as careful lubrication, periodical cleaning and inspection of internal parts. Since it is necessary to separate suction rolls from the frame of machine when installing new wires or felts, make sure parts are clean and replaced properly. Keep the couch roll clean of limed-up stock just outside of the usual wire travel. This increased diameter may cause bad edge on the wire should it run on this increased diameter. It is wise to caliper the couch diameter occasionally. It should be ground straight. Do not start the couch off too fast at it will only slip inside of wire to wear both.

Do not allow balled-up stock to go through a press. You may tear a felt, and this ball of stock may give the rubber on the roll such a jolt in a concentrated spot as to be the cause of starting the rubber cover loosening from the body. Especially is this true on rubber covered suction presses.

When rolls are out of service on the machine, store them carefully, paint and grease where necessary, box or protect them from abrasion. Rubber covered rolls should be stored in a dark cool place, resting on the journals and turned occasionally. Before putting back into service after standing some time it is advisable to grind as the skin surface may be hardened. Granite rolls when out of service should be stored lying flat. It also should be turned occasionally. Should a granite roll be stored after being in service on a machine, it should be stored away from heat or direct sunlight. It is advisable to keep granite surface dampened. You must not allow journals on granite rolls to run hot.

One of the most important things and least cared for on a paper machine is the weight levers for loading presses. They control the pressing out of water from the sheet and this amount varies of course with the position and number of weights carried. They should carry at all times the maximum loading as a very small percentage of moisture in the sheet going to the dryers is reflected quickly in steam consumption.

Since weight levers and connecting rods are a "must" on most machines, keep them in such repair that they do not bind. See that turnbuckles and nuts are free and keep the weight arms, both the main weight arm and the compound arm, horizontal when carrying maximum load. Do not allow rods to cramp against holes through the frame. If all of these work freely, more loading may be carried on the presses which means pressing out more water and a saving of steam.

No conversation or discussion of paper machines could be complete which did not include the dryer section. True, it seems to roll along with far less attention than the wet end but just how well it functions gives little concern until it reaches a state where it can't keep up and sometimes this is bad because many machines have drying capacity above usual paper speeds and weights made. Number one on dryers—keep them clean—clean inside and out—keep water and oil accumulation out of the inside. To do this, the siphon devices must be kept in good repair. Keep the steam fits in repair and see that they do not leak. A blowing joint will soon ruin the seat surfaces. The newer types of steam fits are self-balancing at various pressures and will reduce the total horsepower of the machine. Do not carry higher steam pressures in your dryers without consulting your manufacturer. Keep the outside of dryers clean. It pays dividends in higher drying rate and finish of paper. Wet end doctors in dryers are a "must" to do this; just how many depends on total number of dryers, tons of paper made and the stock furnish. Before doctors are installed on dirty dryers, they must be thoroughly cleaned.

Now is the time to examine dryer gears. Machines have been running seven days a week with short shutdown periods. Many gear and pinion teeth are worn thin. Why wait for these to snap and cause a serious break-down? Replace them before this happens.

The subject of care and maintenance of a paper machine has been advanced many times in print. Perhaps there is nothing new to offer. However, we live with it from day to day and it is still true that the wheel that squeaks the loudest gets attended to first, but why wait for the squeak?

Use high class men to patrol your paper machines looking for mechanical troubles. Their job should carry on constantly. Their worth is to anticipate mechanical troubles before they happen. A man of this caliber is a "pearl of great price." He probably is "he-man" enough to get mad if you called him "Pearl," however. It takes your eyes and ears, sense of smell and touch to detect trouble in advance around machinery.

Tht manufacturer of your equipment has learned the hard way from many experiences of many mills. The benefit of this accumulated experience you may have through their representatives for the asking.

Many times an outsider sees things that due to familiarity at the mill do not register. So be frank in discussing your needs and requirements. Such confidences are never violated.

Maintenance of Converting Equipment

(Compiled by Maintenance of Converting Equipment Committee. Chairman—Walter J. Goettsch, S. M. Langston Co.)

Converting equipment comprises so many different types and sizes of machines that specific and detailed practical suggestions can be made intelligently only if there is a clear understanding of what particular size and type of machine is under consideration. Individual builders will be happy to make suggestions that will apply to their particular unit.

The following general rules will apply to all equipment.

Make frequent and thorough inspection of equipment. "A stitch in time saves nine." Don't wait for breakdowns.

Keep machines clean. It is impossible to inspect carefully a dirty machine. Clean

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1. To secure wider employee participation.
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If your firm has not already installed the Pay-Roll War Savings Plan, *now is the time to do so.* For full details, plus samples of result-getting literature and promotional helps, write, wire, or phone: War Savings Staff, Section E, Treasury Department, 709 Twelfth Street NW., Washington, D. C.

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THE PAPER INDUSTRY AND PAPER WORLD

machines always require less repair work.

Check lubrication. Oil and grease are less critical and more readily replaced than bearings and gears.

Avoid overload and excessive speed. What was safe last year with experienced operators may be hazardous for both man and machine with inexperienced crews.

Educate operating personnel in proper operation of equipment, and adjustment of working parts. Rough handling can ruin a collapsible shaft promptly. Careless setting of a slitter blade will cut down its useful life greatly.

Anticipate need for replacement parts. Remember it takes longer to get them.

Keep in touch with the builders of your equipment. They want to help you keep it running and in most cases can supply helpful data on proper methods of operation, as well as maintenance.

Maintenance of Refining Equipment

(Compiled by Maintenance of Refining Equipment Committee. Chairman—S. H. Jones, E. D. Jones & Sons Co.)

The Committee on Maintenance of Refining Equipment is pleased to offer a brief statement on priorities and fourteen elaborated points covering maintenance.

Most of our fourteen points apply to beaters, jordans and screens. This is necessarily so because of time and space limitations and because these units are still more widely accepted as refining equipment than other sound and satisfactory machines such as the Noble & Wood Mill, Hydrofiner, Sutherland Refiner, Bauer Refiner, Cyclofiner, Precision Beaters, etc. Some of our points may apply to these machines as well.

Machinery and machine parts consume critical materials, all of which are under basic control of War Production Board to varying degrees. For example, elimination of all copper bearing metals, M-9-C, and only 40 per cent of tin used in year 1940. These controls create serious problems to us, the suppliers, in delayed deliveries, frozen inventories, quotas below normal industry requirements, substitutes, high costs, etc., and make it imperative that you anticipate requirements far in advance.

This serious situation requires your sympathetic understanding as many parts and lines are discontinued and those stocked may be frozen for specific release by War Production Board upon appeal from distressed mills. We may not be allowed to accept your orders as the Government has limited the orders you can place and we can accept under L-83, the intent of which is to stop the use of critical metals and to open our capacity for more guns, tanks, ships, etc., at direct expense of paper industry operations.

Thoroughly and Regularly Clean All Equipment Inside and Out, Particularly If Shutdown for Week Ends, etc.—Clean machinery helps to make better paper. Dried and hardened stock lodged in such places as screen plates will cause inefficient operation and excessive wear. Imminent breakdown is more readily detected. Keep all painted surfaces completely covered with paint.

Don't Apply More Power Than Sanctioned by the Manufacturer of the Refining Machine—Too much power generally leads to shaft and bearing trouble. In a jordan engine high power input builds up pressure on the working surfaces of the bars or knives resulting in rapid breakdown of some types of filling.

Inspect Jordan and Refiner Fillings Frequently and on a Regular Schedule—Wrecks resulting from erosion or breakdown of wood fillers can be anticipated and avoided. A set of new woods at the proper time will save many a filling.

Don't Try to Economize by Making Your Own Wood Fillings—The fit of woods is very important. They must be tight at the bottom of the bar as well as at the top. All filling manufacturers have good equipment for making woods accurately. It's poor economy to jeopardize those last few irreplaceable Bronze, Monel and Stainless fillings with improperly fitted woods.

Rebuild Non-Corrosive Fillings as Often as Necessary—Remove carefully all bars and woods. Mill true all working edges of bars to eliminate notches and waviness caused by normal wear. Re-install the bars using new woods of the proper height. The life of many non-corrosive fillings now running can be greatly extended by such a program and it is also further insurance against wrecks.

Don't Discard Wrecked or Worn Out Non-Corrosive Fillings—Jordan shell bars can be made from worn out plug bars. A wrecked filling may produce enough good bars which in combination with those from another wreck, may be combined to make a filling for some mill making a critical paper.

Carefully and Properly Grind in All New Fillings—This operation is very important. Most manufacturers of refining equipment have prepared bulletins outlining the proper procedures. They should be secured and followed carefully.

Don't Feed Sheet Pulp or Laps Carelessly or Too Fast to a Conventional Beater—A beater cannot do a good job of beating if it has to operate as a breaker also. The breaking or pulping operation is carried out better and more efficiently in one of the many strictly pulping machines. Breaking in an ordinary beater is bound to cause misalignment of bed plate and roll as well as bend the bars in both. If it is absolutely necessary to break and beat in the same engine, the stock must be well opened up in feeding and thrown in at a moderate rate.

Inspect Frequently Internal Mechanism of Beater Lighters—This operation should be performed especially if pulping is done in the beater. Broken lighter screws, etc., will permit roll to become worn out of round rendering the filling unfit for use.

Don't Force Excessive Volume of Stock Through Screens—This forcing should especially not be practiced now because of the increased amount of dirt in today's stocks. A screen always performs best if it screens gently with proper combination of cylinder speed, shake speed and shake throw for the grade and kind of stock being run.

Inspect Deckle Straps or Packing Bands at Open End of Screen Cylinder—These should be removed, inspected and cleaned once a week. It is highly desirable to have a spare set which may be used alternate weeks. Deckles should be inspected for wear as well as for dirt. This is important to prevent firmation of lumps as well as prevent wear on cylinder heads.

Don't Permit Dirt to Accumulate in the Screen Vat—The increased volume of dirt under today's operating conditions makes it important to remove screen tailings promptly, delivering to a tailings system of adequate capacity, whether centrifiner, purifiner, riffler or auxiliary screen.

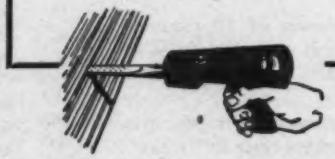
Maintain Screen Shower Properly to Prolong Screen Plate Life and Secure Operating Efficiency—Proper shower functioning is extremely important. Make sure that the shower is operating at adequate pressure and with sufficient and uniform scouring action to keep the plates open. Determine what pressure is sufficient (from 25 to 60 lb. depending on the grade of stock and fineness of slots) and see that pressure gauge is installed either at the shower pipe or in a position to detect drop in pressure. Check pressure frequently.

Examine underside of cylinder to make sure shower is keeping plates open along entire cylinder. Clean, open screen slots will maintain their sharp, smooth edge much longer than when improper shower operation permits accumulation of fibers in the slots.

Wearing or uneven movement of the screen cylinder indicates clogged screen plates.

The life of the plates may be adversely

MINIMIZE REGISTER TROUBLES



The Cambridge Printers' Moisture Indicator tells at a glance whether or not the moisture content of the paper and the room are in balance. Thus the printer knows when it is safe to run. He can cut storage time to a minimum and avoid register troubles. Recommend the use of this instrument to your customers. It will reduce off-register complaints.

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affected by the use of white water in the shower particularly when the stock contains filler or other material of an abrasive nature.

Use Care in Handling Screen Plates—Because the hard rolled phosphor bronze and hard rolled copper of which screen plates are made are critically needed in the war program, it is important to use the utmost care in their maintenance and replacement. Use particular care, during clean-ups, not to damage screen plates. Gauge them for slot width at regular intervals. Consideration should be given to the possibilities of plating, re-rolling and re-cutting of used plates.

Worn out or discarded plates should be carefully segregated from the general scrap pile and their description supplied the manufacturer so that proper disposal and replacement may be effected.

Maintenance Pulping Equipment

(Compiled by Maintenance of Pulping Equipment Committee. Chairman — John Noble, Improved Paper Machinery Corp.)

First and foremost, we recommend increasing present time spent on inspection of equipment by 100 per cent.

Secondly, review of operating instructions and information on equipment by operators.

GRINDERS

Keep stones in warm, dry place, supported above floor for free circulation of air.

Keep stone dressing device in excellent mechanical condition to aid in proper burring. Burr alternately in each direction across stone.

Avoid over-dressing thus losing good stone material when dulling back.

Provide tight cylinder and gland packings.

Clean out wood stock, leave feeding doors open and provide ventilation in and around grinder when shutting down for week-ends or for long periods.

Always back-off the pockets after grinder is shut down.

Store properly and protect all spare parts given to rust.

Maintain steady and reliable speed for the stone and proper pressures in cylinders.

Avoid turning cold showers against a hot stone.

Do not adjust pockets towards stone while it is turning.

Do not hang stone off center and lose good stone material when truing and dressing.

Do not employ dull burrs when dressing stone.

Do not permit leaky grinder valves.

CHIPPERS

Keep disc and bed knives sharp and properly adjusted.

Keep disc true.

Keep bearings tight and use proper lubrication.

Watch end thrust.

DIGESTERS—(LINED)

Bring to temperature slowly after properly curing new lining.

THIS PAPER

may have passed through a MORRIS Centrifugal Pump

. . . because Morris Pumps are widely used in paper and pulp mills all over the country. There's an exactly suitable Morris Pump type for every mill service, including clear water, chemical liquors, and heavy pulp.

The Morris line also includes special designs for every other process liquid or liquid mixture, whether chemically corrosive, sharply abrasive, or pulpy in nature. For 78 years, Morris has specialized on the "hard-to-handle" services.

WE HAVE ENLISTED "FOR THE DURATION"

We have placed at the disposal of the Government all our facilities that might be of use in the national war effort. But our remaining facilities are at your service, and also the advice of our engineers to help you secure best results from your present equipment and to plan for your future needs.

MORRIS MACHINE WORKS

MORRIS ESTABLISHED 1864

BALDWINSVILLE NEW YORK

CENTRIFUGAL PUMPS

Repair small leaks immediately to save steel shell.

Avoid sudden change in temperature of digester building.

ROTARY SCREENS

See that rotor is balanced and bolts in rotor assembly are tight and lubricate according to manufacturer's specifications.

In changing paddles, renew by pairs to maintain balance.

Do not discard paddle if out of weight, but combine with paddle of equal weight to make up new pair.

BLOW PITS AND DIFFUSERS

Check bottoms frequently before excessive wear occurs and check supporting members.

FLAT SCREENS

Use only the greases specified or the equivalent.

Where screens are equipped with Keystone fittings for gauging amount of grease, be sure screen is stopped before greasing. If shaft heats, check that grease seals are saturated with oil.

From time to time, all bolts in screens should be tightened. Check also that the end collars on the rocker shafts are tight against bearing housings.

Do not use an "as good" grease unless its qualities are equal. Never use the rocker-shaft bearing grease in antifriction bearings.

Do not attempt to cool a hot and antifriction bearing by using oil. Instead, clean out old bearing, wash with "slicing oil" and repack. Do not use kerosene.

Never oil rubber torsion bushings. Never replace one at a time but change both of a pair to insure even distribution of load.

Do not allow variable speed drive to run continuously in one position — it will "freeze" in this location, or else pound out where disc fits on shaft.

WASHERS AND THICKENERS

Vacuum and Open Cylinder Type

Maintain all packing glands in good condition and do not over-tighten.

Keep wires clean with ample pressure water.

Apply wires as tight as possible.

On rubber-covered machines, be sure sealing water is on before starting.

Keep couch and press rolls in alignment and adjustment.

On mechanical variable speed transmissions, grease frequently, clean out excess grease, and run them through full range once per week.

Do not spot solder to prevent creeping.

Never allow fire from torch to come near rubber.

Never walk on cylinder moulds.

Do not adjust doctors too tightly against rubber-covered rolls to avoid scoring.

Never allow lime sludge filter wire to become dry, thus preventing hard lime formation.

BLEACHER

Maintain efficient ventilation to protect building and equipment from corrosive fumes.

RECOVERY FURNACES

See boilers and abraisives maintenance.

EVAPORATORS

See boiler maintenance.

CAUSTICIZING EQUIPMENT

Maintain accurate control due to high production rates and difficulty of obtaining replacements.

Check lubrication regularly and change lubricants as instructed.

Inspect all equipment for corrosion and mechanical defects regularly.

Do not use thickeners for storage. Avoid strains due to overloading.

Don't use maximum pump stroke nor prod diaphragms with sharp sticks when attempting to free pump valves, get best possible life from the rubber.

Don't slake at high dilution, this causes slow settling and abrasion.

Don't run until machines break down. A short shut down and a few repairs save many headaches.

LIME KILN

Avoid excess temperature at firing end of furnace.

Wire Conservation

(Compiled by Maintenance of Paper Machine Clothing (Fourdrinier Wire Section) Committee. Associate Chairmen—A. Fred. Crossman, Lindsay Wire Weaving Co. and Harry Specht, Eastwood-Nealley Corp.)

Inspect wire carefully before installing. Call freight agent in case of damage.

Hold poles securely when unrolling wire to prevent pinching.

Protect wire when installing or removing paper machine parts, such as suction boxes and table rolls.

Start up the fourdrinier machine smoothly and slowly.

Keep doctors in good condition and adjustment. Use sufficient showers and in proper positions.

Run wire under sufficient tension to prevent slippage on couch roll.

Keep edges clean and well lubricated with fresh water showers.

Support dandy rolls with table rolls to prevent cracking back of seam.

Keep suction box covers in good condition and edges properly beveled.

Properly guard all pulleys and movable equipment above or around the wire to prevent damage from flying bolts, etc.

Don't slide machine parts directly on wire. Don't walk on wire.

Don't drop third pole when rope ties are cut. Hold it securely, then swing out and away to keep cloth taut.

Don't allow stock to cause bumps and holes in wire.

Don't allow rolls to become concave at edges of wire or allow guide pan to damage edge.

Don't tighten wire when not in proper alignment.

Don't increase wire tension, if slack spot appears, to cause a wrinkle or ridge.

Don't permit edges to become loaded with stock and fillers.

Don't sour a wire if any other method can be used to clean it.

Don't operate a wire if the wire is frozen and grooving the suction box. Oscillate boxes by hand to relieve freezing if necessary.

Don't use rolls that are sprung or out of balance.

Conservation of Dryer Felts

(Compiled by Maintenance of Paper Machine Clothing (Dryer Felt Section) Committee. Chairman—B. L. Whittier, Mt. Vernon-Woodberry Mills.)

Store in dry place—off cement floor.

Have best ventilation possible on machines.

Be careful when putting on seam. A

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little extra time in making sure of a good seam, put in straight, may mean a lot.

Run with even tension throughout life of felt.

Don't use any more steam than necessary. Felts burn out.

Don't let any water drip on felt.

Don't allow oil leakage in bearings. Oil can damage the edges of felts.

Don't let any acid get on felt.

Inorganic Supplies

(Compiled by Conservation of Inorganic Supplies Committee. Chairman—Olin W. Calligban. Edgar Bros. Co.)

The stepping up of the war effort, swinging the normal flow of paper and board away from its usual market, has greatly affected the supply and demand of materials such as heavy pigments, clay, mica, starch and other adhesives. Generally speaking, and almost without exception, there is an ample supply of all of these materials to take care of present consumption and for the duration.

The transportation problem, while in the hands of the government, offers no immediate complications except that sometimes you might have to wait a day or two for an empty car, and that importations, especially from South America, are practically at a standstill. Voluntary loading of all cars to a maximum has greatly helped the car situation.

Transition from paper, burlap or cotton bags, if the material is so packaged, to bulk form shipments might be necessary. There is no time like the present to set up the machinery to return used bags to the supplier for refilling, if the package will stand additional trips, or to rebuild storage bins to receive bulk deliveries.

Mill inventories should be kept at a maximum or at least to where a delay of ten days would not affect mill operations.

CLAY

For both coating and filling the longer the make-down the better the slip.

If possible use clay-milk dilution system for addition to beaters.

Try to use slip for beater addition from one to three pounds per gallon.

Make all types of coating clays down separately before blending.

The longer the clay-adhesive blends mix together the greater the intimacy. Less adhesive needed.

Never pile bagged clap too high.

Never store high moisture clay for any length of time in paper bags.

When possible screen all clay before using in or on paper.

Never store bulk clay in damp bins or where water can reach it.

Never depend on one grade of clay to do the whole job of filling or coating—use blends of several clays having special properties.

STARCH AND DEXTRINS

Starches are divided into three principal groups: pearl starch, modified starch, and starch chemical combinations. Papermakers are interested in the following modifications: (1) chlorinated starch; (2) thin boiling (acid treated) starch; (3) dextrin (acid

Forestry Field Day **featuring pulpwood cutting was sponsored by the National Container Corporation of Starke, Florida. Hollywood has nothing on these fair contestants!**

Florida now has four pulp mills and six paper mills. The narrowest machine, a combination Harper Fourdrinier and four-cylinder machine, is 36 inches in width. The widest machine is a Fourdrinier trimming 224 inches of paper.

Wherever your mill is, whatever it makes and regardless of widths, you can depend on getting the right felts from *Draper Brothers Company.*

Draper Felts Favor Efficiency at

DRAPER BROTHERS COMPANY

Woolen Manufacturers Since 1856 CANTON, MASS.

OUR REPRESENTATIVES *to serve you*

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O. J. LELOFF, Vancouver, Wash.

roasted); (4) converted starch (enzyme treated); (5) special converted starch.

Dextrinized starches seem to have the edge in combining solid fiber paperboard and pasting sheet-lined paperboard.

Converted starches of low viscosity work better on machine coating because of less water and necessity of rapid drying. High viscosity starch is also used in some cases in machine coatings.

Oxidized starches are best for coating. Their unique colloidal properties give better dispersion and absorption resulting in more stable mixes and uniform composition, better flowing properties and higher wax.

Use oxidized starches on blueprint and other rag content papers, better ink resistance and surface.

Calender starches are generally modified starches or slightly modified because oxidized starches are expensive.

To control viscosity with enzyme-converted starches maintain same condition of *p*H, conversion time, temperature, concentration, percent enzyme, etc.

GLUE

Availability—The demand for glue is running greatly in excess of supply and as raw materials for making it are not available in unlimited quantities, it is impossible to increase production to satisfy the entire needs of the trade. In preference to selling the available glue at a premium to certain customers all production is and has been since January, 1941, distributed on a quota arrangement based on purchases made during the previous two years. All customers are receiving as much glue as purchased on the average during 1939 and 1940.

The glue that is manufactured under present conditions is made from the same materials and with the same care and supervision as during normal times. The resultant product is of the same high quality and of uniform strength and working properties. There is only one sound way to manufacture glue and in times like the present, the quality is not impaired through the substitution of inferior materials and workmanship.

Packaging—Standard packages are still burlap bags running from 200 to 300 lb. each. The shortage of these containers necessitates our retention of the title to them as our property, requesting they be returned to us when empty for re-use to guard against uninterrupted delivery service.

Transportation Problems—Shipments are all by public carrier, both rail and truck and considering the heavy burden the war has placed on such facilities, deliveries have been remarkably good, complaints from loss or delay being at a minimum.

Storage—The demand for glue has been such our branch warehouse stocks have been exhausted, replacement has been impossible, direct factory to consumer delivery is the rule now.

New Uses—It is not expected that glue will be available in unlimited quantities during the war period hence the use of it in items and operations not previously employing it, is not advocated. All manufacturers are subject to conditions beyond their control including acts of the Government that might interfere with production or distribution. This condition is not anticipated but none of us know the proportions the war situation will reach and it is impossible to make any definite commitments and all statements must be made with a big "IF" attached.

CALCIUM CARBONATE

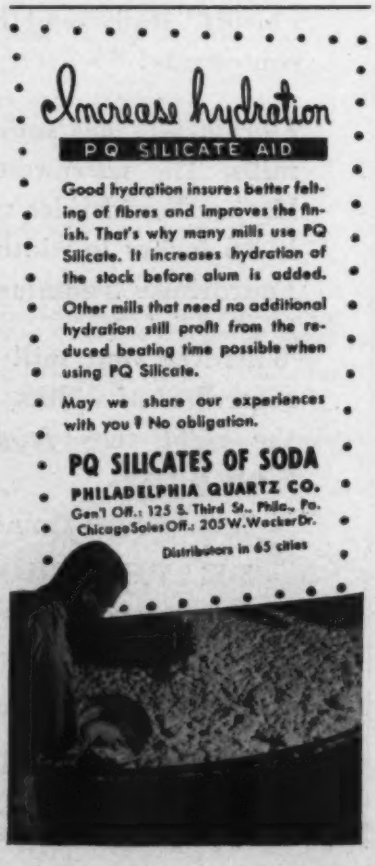
Availability—The supplies of calcium carbonate are ample to meet all the requirements of paper mills for both coating and filler materials.

Transportation Problems—No serious transportation difficulties have been experienced or are expected in supplying paper mills with their requirements of calcium carbonate.

Packaging Difficulties—Calcium carbonate is shipped to paper mills in multi-wall paper bags. The shortages of burlap or steel for packaging have not, therefore, affected the manner in which calcium carbonate is shipped very suitably.

Storage Problems—The better grades of calcium carbonate are not stored in bulk but as shipments of bagged material. The customary precautions for storage of paper packaged commodities suffice, and under these conditions there is only a very negligible loss of material and a high grade of carbonate can be stored for long periods of time.

Best Methods of Plant Adaptation—I am sorry not to be able to answer this question more in detail because all paper mills do not use calcium carbonate in exactly the same way. We are sure this diversification of plant practice is true of almost all chemical supplies and is not peculiar to the paper industry. We believe, therefore, it would be better not to submit any hard and fast rule for the use of calcium carbonate by paper mills.


Increase hydration
PQ SILICATE AID
Good hydration insures better felting of fibres and improves the finish. That's why many mills use PQ Silicate. It increases hydration of the stock before alum is added.
Other mills that need no additional hydration still profit from the reduced beating time possible when using PQ Silicate.
May we share our experiences with you? No obligation.
PQ SILICATES OF SODA
PHILADELPHIA QUARTZ CO.
Gen'l Off.: 125 S. Third St., Phila., Pa.
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Distributors in 65 cities

OTHER FILLERS

Such fillers as gypsum, talc, agalite, asbestine, crown and pearl filler, special chalk, calcium carbonate, barytes, etc., have been affected to some extent by the war, but not enough to affect their procurement so that the special properties of each can be retained in the papers containing them as fillers.

Considerable development work is being done on special fillers and after the war you can expect real advancements in the use of them all.

The war will have a definite effect upon the availability of zinc sulphide pigments during 1942, inasmuch as great quantities of them are required in numerous defense products. Due to the demand, it is impossible to say at this time what tonnage of zinc sulphide pigment will be used in paper products.

While none of the inert pigments can compete in performance with zinc sulphide pigments, they can be used as substitutes, if necessary, in those papers which do not require a high degree of whiteness, brightness and opacity.

Pumps

(Compiled by the Maintenance of Pumps Committee. Chairman — John H. Hall, Warren Steam Pump Co.)

ROTARY VACUUM PUMPS

Check oil level in bearings regularly, preferably with pump at rest.

Check packing and replace before it becomes too hard.

Check seal water lines for clogging.

Check bearing nuts on pump shaft to be sure they remain tight.

Install separation system if white water pull over is excessive or if water contains abrasive material or is corrosive.

Don't operate pump above maximum recommended speed.

Don't operate pump with excessive white water pull over. Check separation system.

Don't operate pump with excessive belt tension—use larger pulleys or wider belt if necessary.

RECIPROCATING PUMPS

Change valve springs annually.

Lubricate piston and valve rods every 4 hours.

Lubricate steam cylinders.

Don't tighten stuffing boxes too much.

Don't allow glands to ride on piston rods.

Don't operate too fast.

CENTRIFUGAL PUMPS (WATER)

Close discharge valve before starting and stopping pump.

Keep a small amount of water dripping from stuffing boxes.

Use same gasket thickness when replacing case cover.

Don't operate a pump dry; see that it is primed before starting.

Don't overpack grease lubricated ball bearing housings.

Don't overlook changing lubricating oil.

CENTRIFUGAL PUMPS (STOCK)

Throttle capacity of pump in discharge line.

Locate pump so that stock will flow to pump suction nozzle.

Connect water seal to clear water supply.

Don't have filling line discharge over pump suction.

Don't have pump support piping.

Don't operate a misaligned pump; coupling will not compensate for misalignment.

Auxiliary Equipment

(Compiled by Maintenance of Auxiliary Equipment Committee. Chairman — S. W. Fletcher, J. O. Ross Engineering Co.)

AIR CONDITIONING APPARATUS

Blow out compressed air filter daily. Clean wet bulb wick daily, and if it becomes hard after drying, replace it by a new one.

Clean cooling coils at least twice a year by spraying water hose on them from the inlet air side.

Blow off and clean all strainers, especially the built-in strainer at the bottom of the condenser water regulating valve. Clean the immersion water heater twice a year.

Check entire Freon System piping, coils and compressor with a Halide torch at regular intervals.

Don't shut off water supply to condensor of refrigerating plant.

Don't allow filters for cleaning air to become dirty. It will materially lower the amount of air handled.

Don't fail to inspect and clean water spray nozzles. They should always deliver a cone of very fine spray.

Don't tighten up packing nut on the stem of the air operated automatic steam valves. Should be finger tight only. A drop of oil on the stem occasionally will prevent binding.

SPRINKLER SYSTEMS

Run the pump a few minutes each week to be sure pump is in proper working order. Keep pump glands properly packed.

Keep surrounding atmosphere warm enough to prevent freezing.

Keep valve seats free of direct or foreign matter.

Don't fill with water or allow water to stand in dry pipe systems.

Don't apply grease, tallow or other oily substance to ball valve seats.

Don't expose heads to undue heat, such as hot air duct, steam pipes, etc.

BELTING

Repair any minor injury at once. Rubber belt injuries may be vulcanized.

Keep oil away from rubber belts. Store belts in dry, cool places away from the light.

Check pulleys and shafts for alignment and run belts in as moderate temperature as possible.

Use belting of ample size to transmit required power and salvage belting by reworking large belts into small ones.

Make sure pulleys are clean and smooth

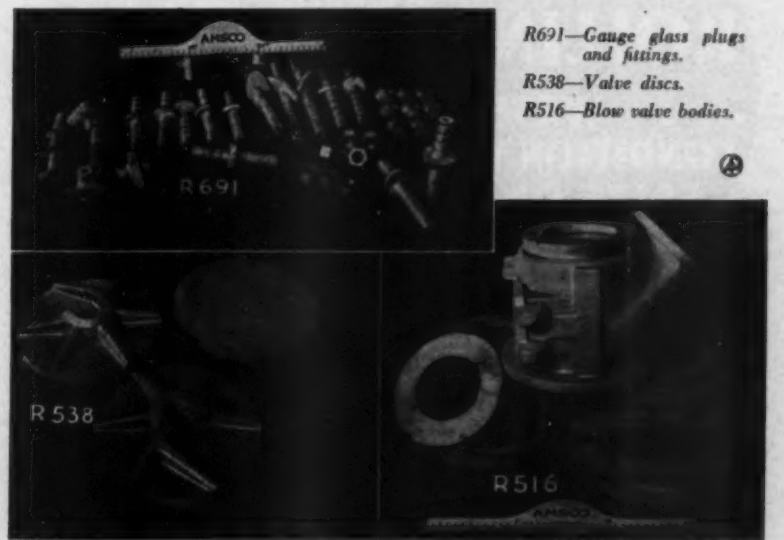
As With Paper, There Is a Particular Amsco Alloy for Each Application

To use a fast corroding metal for fittings in a sulfite digester would be as foolish—and as expensive, as using fine book or enamel paper for wrapping. Papers and alloys differ with the jobs they have to do; and Amsco Alloy F-12, a chromium-nickel combination, has been developed in Amsco's research laboratory for the particular purpose of resisting the heat and corrosive conditions encountered in digesters.

The stringent conservation of metals so vital at this time makes the new alloy, produced specifically for the paper industry under T.A.P.P.I. specifications, so important to paper manufacturers. The ductility of this corrosion-resisting Amsco F-12 reduces the incidence of fracture from load carrying, compression and other stresses; it is moderately priced; it further reduces costs by being easily machined; and it is available in castings for all requirements in digesters.

Long lasting metal digester fittings are not only less expensive in the long run, but they conform to the nation's demand that metal be saved wherever possible. Fittings of Amsco F-12, by withstanding the corrosive attacks of caustic soda, sulfite of soda, calcium bisulfite and sulfuric acid, save materially over steel parts which require frequent replacement and entail costly delays.

Amsco engineers and metallurgists will gladly recommend other ways of conserving metals and of securing maximum operating efficiency in pulp and paper mills. Ask, too, for Bulletin 108 which tells the story of Amsco Alloys for the process industries.



R691—Gauge glass plugs and fittings.
R538—Valve discs.
R516—Blow valve bodies.

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AMERICAN MANGANESE STEEL DIVISION
OF THE AMERICAN BRAKE SHOE & FOUNDRY CO.
Chicago Heights, Illinois

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and avoid the use of idlers wherever possible.

Re-cement edges and ends of laps whenever they show signs of opening and run the belt in such direction that tip of lap on outer ply trails.

Don't use dressing on rubber belts, particularly rosin as it is damaging to rubber belt surfaces. Use a vegetable oil, if surface becomes glazed.

Don't run belt at tension greater than necessary to carry the load without slippage.

Don't force belts on pulleys with pries or tools. It is better to loosen motor mountings.

Don't run belt edge against any stationary object, or let shifter or step cone or flanged pulley rub belt edges.

Don't use a belt too thick for the diameter of the pulleys over which it operates.

Don't tolerate slippage. Investigate and correct cause.

BEARINGS

Keep out dirt, moisture and other foreign matter. Keep seals tight.

Be sure inner race has a tight fit on the shaft.

Be sure bearing is large enough for the duty to which it is subjected.

Use a clean solvent, free from water, when cleaning bearings and rinse in filtered mineral oil and immediately apply fresh lubricant.

Don't remove wrapping from bearings until ready to install them.

Don't apply any more force on the outer race than can be exerted by hand. It is preferable to heat the races and shrink them on the shafts for interference fits.

Don't pound on the outer race as it will produce brinnell marks on the races and damage the rolling elements. Might also crack the raceway.

Don't run a bearing out of line or with excessive thrust load.

TANKS

Paint the hoops to prevent rust.

Be sure that there is air circulation under the bottom to prevent rotting out.

Keep the wood soaked up and the hoops pulled up tight.

Don't paint the inside of the tanks.

Don't allow tank to dry out.

Don't caulk a tank directly in the joint but always about one-half inch on either side of the joint and driving wedges in to force the joint together.

CRANES

Keep all electrical connections tight and parts clean.

Renew arc shields in case they become damaged, as their presence adds materially to the life of the contact and fingers.

See that the brushes move freely in the holders and at the same time make firm even contact with the commutator or collector ring. Keep collector rings clean and smooth.

Replace brake shoes or linings when necessary and be sure that the face of the brake wheel is true.

Caliper bridge drive wheels once a month to be sure they are of the same diameter. If they are not, crane will run out of square and cause flanging.

Turn idler wheels about a quarter revolution occasionally. Helps prevent flat spots.

Don't reverse motors until they come to a standstill.

Don't remove springs from controller handles as this will result in the plugging of motors.

Don't allow the rotor to run against the stator. When the bearings are badly worn, they must be replaced by new ones.

Don't use ordinary lubricating oils on the hoisting cable, as the minerals they contain are detrimental to wiring and core. A mixture of linseed oil and graphite is satisfactory.

Don't overload the cable.

Don't run the crane against the rail stops with force if it runs out of square. Remedy the cause.

MIXERS, BALL MILLS, COLLOIDAL MACHINES

The life of equipment for the processing of coating pigments is comparatively short due to the abrasive condition which does not exist to such an extent in the processing of materials in other industries.

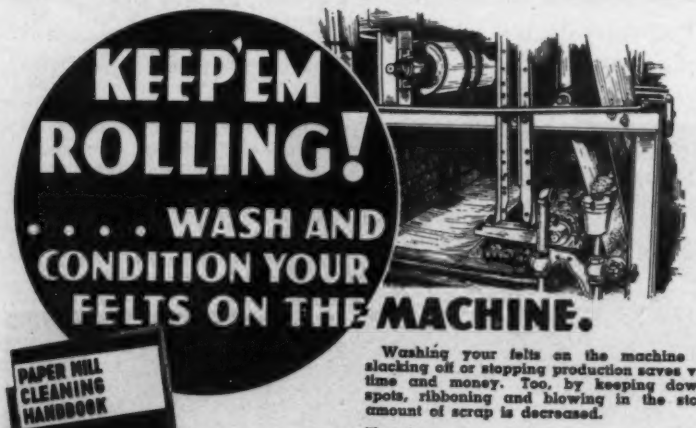
The most noticeable wear would be in the grinding or color dispersion process over roller mills. The grinding surface of rolls on these machines should be looked after constantly and carefully. The first signs of wear should be corrected by regrinding of rolls or trueing up of roll surfaces. The efficiency of roller mills is no better than the condition of the roll surfaces.

Lubrication of moving or operating parts is highly essential to the long life of both mills and mixers, the stuffing boxes and agitator journals on the mixers should be checked frequently to prevent wear and leaking. We might also state that if the roller mill is idle for any length of time the surface of the rolls should be carefully oiled or greased to prevent corrosion as corrosion causes pitting of the roll surfaces affecting good grinding to quite some extent.

Don't abuse your equipment through careless adjustments, unnecessary neglect, overloading, the use of cheap lubrication, etc. The highest quality of maintenance is the cheapest in the end. Due to excessive presence of moisture in the industry, greater care should be maintained than is necessary where this condition does not exist. Water is quite destructive to metal surfaces not protected by waterproof paint, galvanizing or metal resisting corrosion.

MAINTENANCE OF FANS AND BLOWERS

Develop a maintenance schedule whereby each blower and fan is inspected and reported periodically by a maintenance man. Each fan should be scheduled for a thorough inspection of its bearings, coupling, alignment, wheel striking inlet and tightness of foundation bolts both in a running position and when shut down. Today, when



Washing your felts on the machine without slacking off or stopping production saves valuable time and money. Too, by keeping down hard spots, ribboning and blowing in the stock, the amount of scrap is decreased.

There's a

MAGNUS FELT CLEANER

which will enable you to keep 'em rolling on soft, absorbent and well-napped felts. It's used in solution of approximately 1% in the showers while operating. With it, felts are kept in perfect condition for long periods.

Magnus Felt Cleaners are giving excellent results in all types of mills, from board mills to tissue and writing paper mills.

To meet users' many requirements, we have developed several specialized felt cleaners. One of these is adaptable to your particular conditions of felts and stock. Submit your felt cleaning problem to the Magnus Laboratory today. There's no obligation on your part.

Write for your copy of this manual today.

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Magnus CLEANERS

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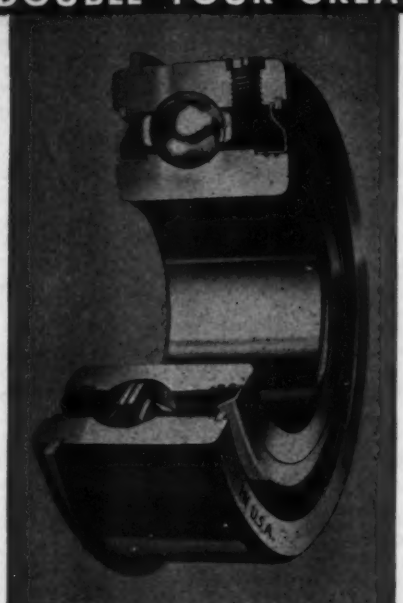

"CARTRIDGE" Ball Bearings have been adopted by hundreds of firms in many lines of industry.

"Cartridge" Ball Bearings
(Patented)

SOME OF THEIR ADVANTAGES:

Can be packed with at least 100% more grease than any self-sealed bearing — especially adapted, therefore, for continuous service for long periods.

Provide positive protection against foreign matter and absolute retention of lubricant—by the use of flanged metal shields, recessed inner ring construction, and two or more grease grooves—the combination affording a truly effective labyrinth.

Are equally efficient in retaining grease in horizontal or vertical position.

Metal shields, though rigidly locked by snap rings, are removable to facilitate inspection, cleaning or re-greasing of bearings.

Can be quickly regreased, either through "built-in" refilling plug opening or by removing metal shields.

Require no lock nuts on shaft or clamping means in housing, because of wide contact areas due to double-row width of both rings —which also prevent "cocking", slippage or "peening".

Reduce costs by simplifying design, eliminating protective closure parts, and saving attendant labor.

Available with shoulder ring, thus permitting a through bore in housing, the shoulder ring providing endwise location.

NORMA-HOFFMANN BEARINGS CORP'N., STAMFORD, CONN. U.S.A.

Write for Catalog F-951 on Cartridge Precision Ball Bearings

it is difficult to obtain priorities for new equipment, it is important that old equipment be kept up in A-1 condition.

Check that fan or blower driven by a V belt drive is not running above the safe speed recommended by the fan manufacturer as the life of the fan will be materially shortened.

Check fans and blowers for being out of balance due to dust accumulations on the wheel when handling dusty air and also due to tie rods on the wheels becoming loosened.

Don't wait until fan or blower lets go before it receives any attention. Blowers seem to have a habit of giving serious trouble when the blower is needed most.

Don't run the fan or blower at a speed to give you the desired volume without due consideration of the safe tip speed, excess horse power and high outlet velocity. Often it is wiser to buy a larger fan.

Don't wait until fan or blower out of balance has ruined the bearings and shaken the fan housing and wheel loose as often happens when fan and blowers are not looked at, except to throw oil at them.

HEATERS

Check traps periodically to be sure they are functioning properly. A faulty trap may ruin a heater by contributing to freezing and water hammer.

Be sure coils are vented thoroughly. An inexpensive auxiliary may save an expensive coil.

Test boiler feed water for acids, especially when copper coils are used.

Don't use pressures higher than heater is designed for.

Don't tolerate water hammer. A properly designed steam system will not have it. Find causes and correct them.

Don't use throttling control on a standard heater when taking outdoor air.

LAMINATED PLASTIC BEARINGS

Provide uniform and complete support for bearings. Fill cavities in housings, using a metal that will not cold flow. If this is impossible, relieve bearing liners in corresponding locations.

Where water lubrication is used, be certain that—

(a) the water supply is constant and ample

(b) the water is clean and free of abrasives

(c) the water temperature is not over 90 Fahr.

(d) the water is not strongly alkaline

(e) the water supply valves are tagged or otherwise marked to prevent unintentional closing

(f) the water supply is distributed across the entire length of the bearing and not localized

Be sure journals are clean and smooth when the bearings are installed.

Protect journals against rusting by coating with film of oil or light grease when not in service.

A "hospital odor" means a heated bearing that requires immediate attention.

Do not use too large bearing sectors. It is suggested that sectors of not over 50 degrees are desirable. This prevents pinching.

Do not install bearings in unmachined housings where surfaces are rough.

Do not attempt to water lubricate bearing for a journal that must operate with an appreciable temperature such as a dryer roll.

Remember that some installations of plastic bearings require oil or grease lubrication.

Be certain that bearings are chamfered at lubricating point to help retain lubricant.

Do not load bearings until they have been run in. A half hour under light load is usually sufficient.

Do not install bearings on shafts running at less than 50 ft. per minute peripheral speed.

MATERIAL HANDLING EQUIPMENT

Keep pulleys clean and the pulley side of conveyor belt clean and free of lumps.

Keep idlers free, in repair, and spaced close enough to prevent belt sag between carriers.

Keep belt properly aligned. Crooked running may be traced to idler adjustment. Increased tension is not the cure.

Keep all grease and oily materials away from belt.

Check brakes each week. Keep free of dirt and oil. True up shoe and fit to drum after relining.

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In spite of war demands... in spite of a record volume of business...we are making all shipments on schedule.

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For valve stems; each strand a perfect piece of lubricated packing.

BRAIDED

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for steam, hot water, air. PALCO for water. PELRO for oils. CUTNO for alkalis. SUPERCUTNO (blue asbestos) for acids. KLERO for foods.

SELF-LUBRICATING PACKINGS

See that all steering connections are kept tight, but that steering control works freely.

Don't load a conveyor belt unevenly or operate at high speed.

Don't permit the load to fall on belt from more than three or four feet without baffles.

Don't allow load to strike belt, a pulley or idler support point. Try to load 18 in. away from support.

Don't allow edge of belt to rub on any object.

Don't allow battery to stand in a discharge condition and be sure there is sufficient distilled water in each cell to cover plates.

Don't delay in repairing broken or damaged covering of vital parts. Admission of foreign material causes serious damage.

Maintenance of Control Instruments

(Compiled by Maintenance of Control Instruments Committee. Chairman—Henry Ehrisman, Foxboro Company.)

It hardly seems necessary to advise paper mill men to take care of their measuring and controlling instruments, or to explain to them the reasons for urging such care at this particular time. The general wartime conditions are known to us all, and the circumstances surrounding the subject of Priorities have become painfully familiar to most of us.

The pulp and paper industry is finding it increasingly difficult to obtain new or replacement equipment, if that equipment involves the use of critical materials which are also needed to make things which can shoot, swim, or fly. The industry must face that fact, and mill men will just have to accept the situation as part of their cooperation and sacrifice in the all-out war effort. But, however willing you may be to cooperate in the Nation's war program, you still have the operation of your mills to think about.

So far as priorities are concerned, the indication is that your worries are going to be not less, but greater. It is apparent that the P-100 A-10 Rating is losing its purchasing power; and you will find it unwise to place too much faith in that blanket rating from now on. At the present time that rating is not high enough to enable you to obtain deliveries on thermal system repairs or replacement parts for a control valve. As you undoubtedly know, you cannot buy new instruments under this blanket rating. Restrictions on the use of P-100 for repair parts and replacements can be expected to increase as soon as present stocks are depleted. In short, every order not only for instrument equipment but for supplies of any kind which are made, wholly or in part of critical materials, will be individually rated, on the basis of its essential importance and its relation to the war production program.

With such prospects ahead, it becomes more important than ever that we take good care of the things we have, for we are not going to find it easy to get others when they are gone. So, the moral of these remarks is simply this: "Take care of your instruments and they will give you long and useful service. Neglect them and you may expect trouble—and still more trouble when you try to replace them."

But the fact of the matter is that your instruments deserve the best possible care anyway, all the time, in war or peace. In the average mill the instruments represent a very sizable investment, one that is worthy of attention. But infinitely greater is the value of the work those instruments do. The control instrument at a single process point may produce savings equal to its own cost price, every week in the year. Surely it would be inexcusable neglect, if that instrument failed to receive its proper care.

The words "proper care" are not used here to mean anything that is difficult or extraordinary, either. The proper care of an industrial instrument is just the reasonable attention that any high-grade operating mechanism should receive, at the hands of a properly qualified person. Industrial instruments are sturdy; they are built for work under mill conditions; they don't ask any special favors. But it is true of them as of any other mechanical equipment, that the length of their valuable service will be seriously shortened by abuse or neglect.

A responsible and competent man should have charge of instrument maintenance in the mill. He should know his job and appreciate its importance. Of course he should be given the facilities to do his job properly. He needs a good, clean workroom of his own. He needs a modest amount of equipment. And he also needs the help which the instrument manufacturers gladly offer him.

Every instrument in the mill was put there to do a certain job. Many of them were designed for their specific service. Each instrument, when it left the factory, was accompanied by an instruction book, telling the maintenance man just how to give that instrument its regular and proper care. If the book has been mislaid, he can get a duplicate of it by writing the maker of the instrument and giving its serial number. That instruction book is important. Generally speaking, it gives all the information that an intelligent mechanic needs to have on its particular subject; but if he has any problems, or if unusual circumstances should arise, the manufacturer's sales engineer will be glad to call and give him the personal help he needs. This point deserves special emphasis, as many instrument users can testify from their own experience: the best place to get help, when outside help is needed, is from the manufacturer of the instrument. For repairs, replacement parts, supplies or service of any kind, call on the company that built the instrument.

There are three fundamental rules for instrument care:

(1) Understand your instruments, by studying the instruction books.

(2) Check all instruments at appropriate regular intervals.

(3) Know what the possible sources of trouble may be at each installation and forestall such troubles by watching for them.

The items which follow do not attempt a complete job of instruction. They merely touch some of the high spots of ordinary reasonable, every-day care, of instruments of almost any type.

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PAPER AND PULP SECTION

NATIONAL SAFETY COUNCIL, INC.
TWENTY NORTH WACKER DRIVE CHICAGO, ILLINOIS

GENERAL MAINTENANCE

Put all instruments in charge of one man.

Have the instrument man write to the instrument companies for complete sets of operating instructions for each instrument in the plant. The instrument serial number should be identified in all correspondence.

Keep a card file with a brief case history on each of your instruments.

Treat instruments as carefully as a fine watch. They are made of the same or better materials; on the same kind of machinery, with the same type of skilled labor —and are expected to give longer service between overhauls.

Check instrument installations and, if necessary, change their location to a place where they will be better protected from excessive heat, fumes, dust, spilled liquor or vibration.

At regular intervals wash pens on recording instruments in hot water. Use the right grade of ink—standard slow drying, quick drying, or low freezing. Thickened ink in pens may cause the record to fail when the pen deviates suddenly as for a process upset.

Don't permit operators generally to do their own adjusting or "fixing."

Don't attempt instrument repair work without a thorough understanding of how to make the necessary repair.

Don't neglect recurrent troubles; locate the cause and correct it.

Don't let dirt or corrosive materials get in or on your instruments. They ruin accuracy, shorten life and, in general, cause more premature failures than can be attributed to any other cause.

Do not install instruments in locations that are inconvenient to the observers, otherwise they will not be used to maximum advantage.

Don't mix various makes of ink.

PRESSURE INSTRUMENT

Select pressure instrument ranges with care so that normal maximum pressure will register between one-half and two-thirds of scale.

Protect pressure sensitive elements from the heat or corrosive effects of the pressure medium being measured. Use a seal wherever necessary.

Where necessary protect pressure instruments from pen whip with a good snubber.

Don't connect a pressure instrument where the pressure might exceed the scale range.

Don't neglect to periodically inspect the condition of seals and pressure piping.

Don't allow pen or pointers to fluctuate wildly in response to violent pressure changes, but don't deaden excessively, otherwise the instrument cannot follow important changes. Don't use a needle valve for a snubber.

TEMPERATURE INSTRUMENT

Fasten any loose or dangling thermal tubing against permanent beams or posts to avoid damage. Run it inside of protection piping where necessary.

Inspect thermal bulbs regularly for evidence of corrosion or physical damage. Especially controller bulbs should be installed without sockets where possible.

Take all possible precautions against overranging temperature instruments.

Have a place to hang glass stem thermometers up and when not in use always hang them there.

When checking temperature instrument readings, be sure to agitate the water or oil in the checking pot continuously—be sure to wait long enough for the instrument being checked, and the test thermometer to come to equilibrium—be sure your test thermometer is accurate, and well immersed —and above all have the test made only by the man in charge of instruments.

Don't fasten thermal tubing where it may come in contact with bare steam pipes, corrosive liquors; or be subject to continuous vibration or flexing.

Don't install a thermal bulb bare if there is danger of physical damage, or if it is impossible to remove it for checking purposes without shutting down the process.

Don't install a temperature instrument where its bulb can be exposed to temperatures exceeding the scale range or over-range limit.

Don't lean glass stem thermometers against walls, boxes, posts, etc., or otherwise handle carelessly.

Don't be misled by incomplete submergence of bulb sensitive portion drifting oil bath temperatures or inadequate oil bath circulation.

FLOW INSTRUMENT

Protect the flow-meter chambers from accumulation of sediment and from corrosive effects of the material being measured. Use seals where necessary and clean out the chambers at regular intervals. Eliminate *all* leaks from the meter piping.

Lubricate pressure tight meter bearings regularly but moderately.

Periodically inspect the condition of and thoroughly clean flow meter primary devices. Be sure pressure taps are made *exactly* as specified, and that the plate is faced the right way.

Don't neglect to periodically inspect the condition of the meter piping and seals.

Do not use lubricant other than that recommended by the instrument manufacturer.

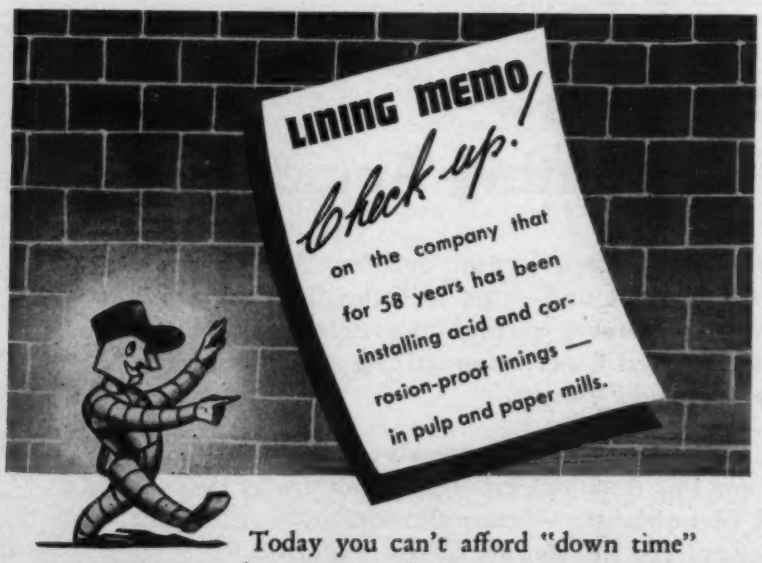
Don't install meter primary devices in any way other than that recommended by the instrument manufacturer, or the Fluid Meters Committee of the A.S.M.E.

CONTROL INSTRUMENT

Supply air-operated controllers with clean dry air.

Handle the precision mechanism in exact accordance with the maker's instructions.

To maintain good automatic operation check the system occasionally on hand control and eliminate or reduce to a minimum any rapid, periodic cycling caused by faulty operation of equipment elsewhere in the system as, for example, sticking steam traps, sloppy operation, etc.



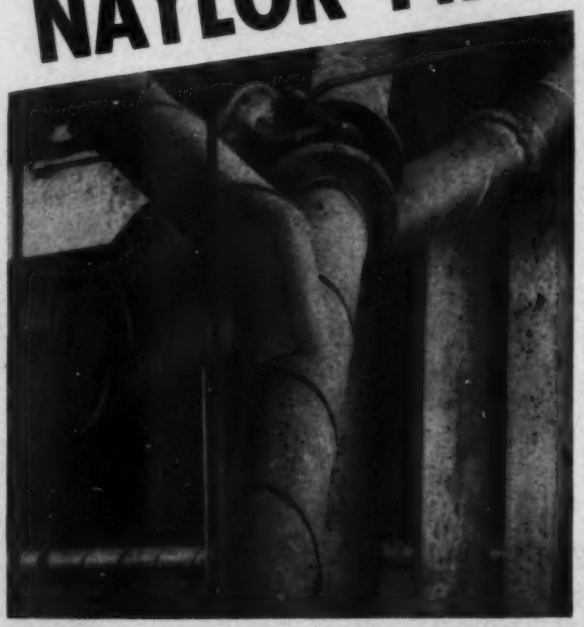
Today you can't afford "down time" to repair or replace improperly designed and installed linings. Never was it more important to remember: "SEMCO" quality — is real economy.

SEMCO

Stebbins Engineering and Manufacturing Company

EASTERN BLVD. WATERTOWN, NEW YORK

SAVE
3 WAYS WITH NAYLOR PIPE



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Naylor's exclusive Lockseam Spiralweld structure creates a reinforced light-weight pipe, requiring about half the steel of standard weight pipe.

2. SAVE WEIGHT

Naylor Pipe cuts handling and shipping costs—simplifies installation or replacements.

3. SAVE MONEY

Naylor fabricates pipe to your exact requirements—no matter how complicated. You save material, time and money while insuring maximum pipe performance.

Sizes from 4 to 30 in diameter with all types of fittings and connections. Write for catalog.

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- Sheet Forming Machines
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CONTROLLED VALVE MAINTENANCE

When tightening pipe into a screwed-end valve during installation, hold the valve with a wrench at the end into which the pipe is being screwed, in order to prevent distortion of the valve seat and resulting leakage.

Valves found leaking through the seat and disc, or through the stuffing box, should be repaired or repacked as promptly as possible. The longer leaks are allowed to continue the more wear and destruction of vital parts occur.

Lubricate valve stems regularly with the recommended lubricant.

Protect valves from distorting stresses applied by weight and expansion of piping.

When installing a screwed-end valve, do not use too much force in making up the joint. You may distort the body and seat, thus causing a leak.

When repairing valves do not lap any more than is necessary to secure a tight valve. Overlapping wears away seat material and does not result in any improvement. Machining of parts should be unnecessary if valves are examined and serviced at regular intervals. Don't disturb valve travel spring adjustments.

Don't force the valve stem packing nut down tight to stop leakage.

When installing valves don't depend on muscle instead of clean sharp threads, or new gaskets to make joints tight.

Maintenance of Electrical Power Plant Equipment

(Compiled by the Committee on the Maintenance of Electrical Equipment. Chairman—W. W. Cronkhite, General Electric Co.)

Have a good electrical man in your organization.

Have regular inspection of each motor or important electric machine and its control.

Keep a record of these inspections as to date made and who made them.

Carry the essential spares either in a complete motor or parts.

Keep good alignment.

Don't over-lubricate. Follow manufacturer's instructions.

Flexible couplings do not give you license to run out of alignment.

Don't leave the controllers on the starting point if motor fails to start promptly.

Don't use emery cloth on commutator or any electrical contacts.

Don't sacrifice reliability for a few points in efficiency. Remember the efficiency is zero when the motor is broken down.

Convention Papers . . . Abridged

The Measurement of Greaseproofness

E. A. GEORGI[1] and PHILIP NOLAN[2]

The purpose of the present work was the development of an objective measurement of greaseproofness. The Hercules Powder Company was contacted by the Glassine and Greaseproof Manufacturers Association in regard to the possibility of the use of their fluorescent size tester as a means for measuring the penetration of oils through paper. Experiments showed that measurements could be made by the fluorescent size tester (Van den Akker, J. A., Nolan, P., Dreshfield, A. C., and Heller, H. F., Fluorescent Size Test, an Improved Method and a New Instrument for Measuring the Water Resistance of Paper. *Paper Trade J.* 109, No. 21:33-42, November 23, 1939), but the method did not seem practical because of low intensity of fluorescence of the oil and dye mixture and the generally slow penetration. Work was suspended on application of this instrument to the problem and further work was carried out in search of a better method. It was decided that a proper and rapid method for measuring the actual volume rate of flow (Institute of Paper Chemistry. Instrumentation Studies XXXIV. Penetration of papers by liquids and solutions. Part I. General Discussion of Phenomena. *Paper Trade J.* 110, No. 4:44-50, Jan. 25, 1940, ... Cobb, R. M., The Cobb Test for Greaseproof Paper. *Paper Trade J.* 106, No. 15:28-29, April 14, 1940) through greaseproof paper for a given applied pressure should be developed from which the resistance to flow could be derived, thus serving to evaluate other indirect measures of greaseproofness in terms of the basic rate of flow.

As a result of the work carried out in the study of the applicability of the fluorescent size tester, the concept of failure pattern of greaseproof sheets was developed. This failure pattern is described as the over-all distribution of failure points corresponding to the penetration of oil or grease through the sheet under externally applied pressure. After a short experience in observing the penetration of oils through sheets under pressure, the definite feeling of the complete development of a typical failure pattern is obtained. This failure pattern shows that the so-called large pinpoint failures of both glassine and greaseproof papers should be considered as characteristic of the sheet, when considered as a whole, rather than erratic fluctuations which are not at all characteristic of the paper and are therefore removed from consideration in testing. For glassine papers, failure patterns generally develop rapidly, whereas for greaseproof papers, such patterns develop slowly and change in appearance over a long period of time due to spreading of the oil or grease, as well as to diffusion of the oil away from the central failure point or capillary. When lard is used as a penetrant, the greaseproof sheet will become uniformly greasy or oily in appearance after several days, whereas glassine sheets will appear only locally spotted with oil even after this long period of time.

The observations which led to the idea of a failure pattern showed that the flow of oil through a sheet could be considered to be the flow through a number of capillaries in parallel both for glassine and for greaseproof sheets, at least for early penetration times.

The question of contact angle is of extreme importance when considering the appearance of a sheet in the judgment of greaseproofness. It has been found that the contact angle is zero for lard oil, castor oil, and turpentine on chemically untreated greaseproof papers which have not been supercalendered. However, for greaseproof papers, which have been treated with starch, wax, or resins, contact angles different from zero have been measured for lard oil and castor oil, but again the contact angle is zero for these papers when turpentine is used (except for the wax treatments).

The spreading of small drops of oil on the surface of these greaseproof papers is most important in the visual appearance

(1) Executive Chemist, Experiment Station, Hercules Powder Company; (2) Research Associate, The Institute of Paper Chemistry.

This is the fifth installment of abridgments of papers presented at the annual meeting of the **Technical Association of the Pulp and Paper Industry,** held in New York City, February 16-19, 1942. Previous installments have appeared consecutively in the March, April, May, and June issues, and will be continued in succeeding issues.

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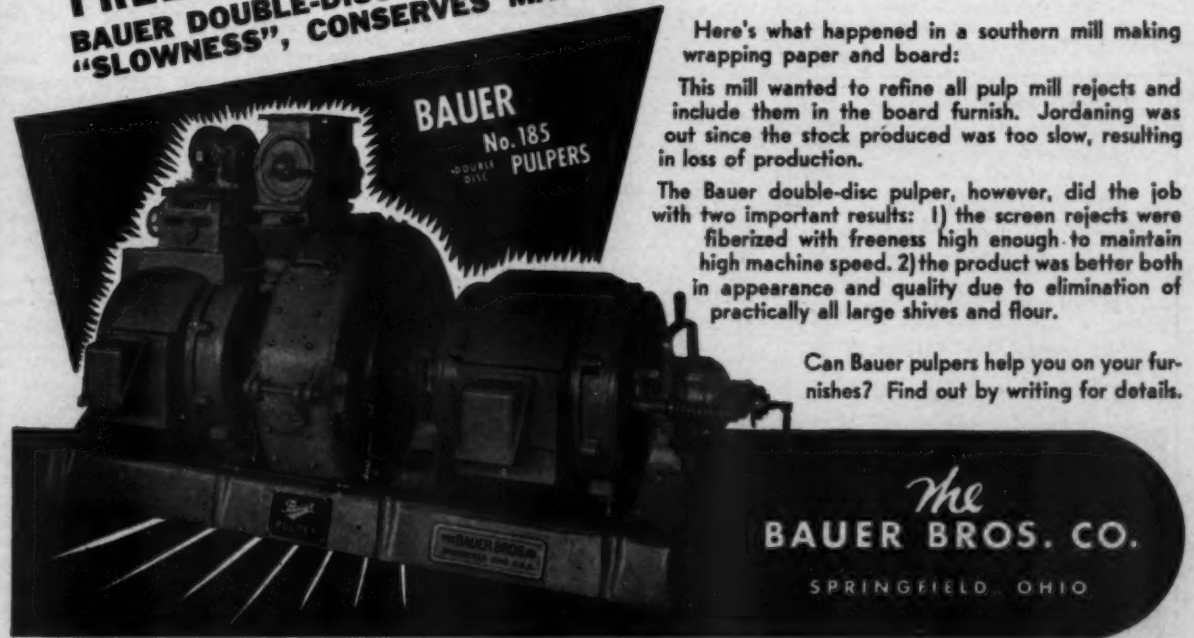

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of translucent greaseproof paper as contrasted with an opaque greaseproof paper and is especially so when the opaque paper is treated so that the contact angle of the penetrant is not zero. In this case the penetrant will be localized to small spot failures at the top surface of the sheet, whereas for the translucent paper, a small volume of oil arriving at the top side of the sheet will spread over large areas on this top side, giving the appearance of large oily spots; this results in the visual judgments of very poor greaseproofness. It is realized that, in the contact angle measurements, the roughness of the paper surface is important but, in general, the rougher the paper, the smaller will be the apparent contact angle and the more the surface will be wetted.

The general equation of flow shows that, after the capillaries have been filled, the volume rate is inversely proportional to the viscosity of the penetrant; the adhesion tension of the penetrant will influence only the time required to fill the capillaries in the sheet. The solvent action of the penetrant is important when considering the testing of chemically treated sheets. One of the important reasons for inversion in order of ranking different samples is the difference in solvent action of the penetrant used for accelerated testing as compared with the solvent properties of the penetrants employed in actual use. Accelerated tests carried out in a short period of time will not truly predict the behavior of a penetrant which dissolves the chemical treating agent slowly, but should show reasonable results when the treating agent is readily soluble in the penetrant.

The main problem in quickly measuring the rate of flow is to obtain a means for measuring small quantities of oil (less than 1 mg.) on the top surface of the sheet. The objective of the measurement is to measure a rate of flow which is controlled by the resistance to flow offered by the paper sheet itself independent of the measuring means, with the only instrumental limitation that of sensitivity of detection. After consideration of several indirect measures of the volume of oil arriving at the top side of the sheet, it was decided to use a photoelectric method employing either diffusely or specularly reflected light from the sheet. Applied pressure is used to accelerate the test with any desired penetrant.

In the first method, the sheet is supported by a plane plate glass. Light is specularly reflected from a sandwich of backing plate (top), glassine or greaseproof paper, oil surface and black backing paper. As oil comes through the greaseproof sheet, optical contact is formed between the greaseproof sheet and the supporting glass plate and the amount of specularly reflected light is decreased, thereby causing a change in photocurrent, which is observed as a function of the time after application of the pressure. This method was abandoned because of inconvenience in technique. In the second method, the light diffusely reflected from the sheet is used for measurement with the sample illuminated by unfiltered tungsten light at 45 deg. and viewed normally to the surface. As oil comes through the sheet, the oil film between the sheet and the supporting glass plate forms optical contact and reduces the light scattered at the top of the sheet, thereby decreasing the photocurrent measured with a sensitive galvanometer. Both of these systems employ a balanced circuit so that fluctuations in lamp voltage do not cause fluctuations in the photocurrent; in this way extremely high sensitivity is obtained. In the present apparatus the sensitivity of detection is 5 mg. per square meter per minute which, for the sample size employed, corresponds to a detection of a change of 0.025 mg. per minute for a fluid with a viscosity of about 5 centipoises.

Table I.—Comparison of Rate of Flow Data With the Glassine and Greaseproof Manufacturers Association Turpentine Test

(The Rate of Flow is Given as mg./60 sq. cm./min.)

Sample	Rate of flow	Average Deviation in %	Turpentine time in sec.*	Rank by rate measurements	Rank by Turpentine Test
1	1060	----	2	1	1
2	36.8	10	12	2	2
3	22.6	20	20	4	4
4	23.2	10	28	3	5
5	14.0	20	14	5	3
6	8.4	15	38	6	7
7	3.4	10	40	9	8
8	4.1	----	40	8	9
9	5.1	20	52	7	10
10	1.7	20	107	10	11
11	0.37	20	32	14	6
12	0.19	----	347	15	14
13	0.54	50	118	13	12
14	0.57	----	377	12	15
15	<0.016	----	1000	----	----
16	0.73	20	203	11	13
17	0.032	----	705	16	16
18	<0.016	----	>1800	**	**
19	<0.016	----	>1800	**	**
20	<0.016	----	>1800	**	**

* Test results supplied by member of Glassine and Greaseproof Association.
** No ranking given for sample at time greater than 1800 sec.

A series of samples of greaseproof paper was provided by the Technical Committee of the Glassine and Greaseproof Manufacturers Association which agreed that a comparison of the volume rate of flow measurement with the Association's standard turpentine time would be of interest in deciding whether or not an objective rate of flow measured would have practical merit. It was also decided to limit the paper in this particular aspect of study to greaseproof papers only and to exclude from the group glassine and supertransparent sheets. The samples chosen were obtained from a given mill and included normal greaseproof as well as chemically treated greaseproof sheets. The data on the volume rate of flow measurements and the Glassine and Greaseproof Association's turpentine test are presented in Table 1. On the basis of these data, samples are ranked in increasing degrees of greaseproofness from 1 to 17. These results show poor correlation of the turpentine test with the rate of flow data. However, the general trend is the same.

The chemically treated sheets with a finite contact angle will in general have much greater preference in greaseproof ranking over sheets having the same number but even smaller capillary diameters with a contact angle of zero. In a similar manner, the opacity of a given sample affects markedly the visual importance assigned to capillary failures of a given size.

There has been a great deal of discussion in the past about the size of sample and the number of specimens required for obtaining a trustworthy average greaseproof index for a given lot of paper. Results show that methods using spot counts after a given time or increasing times give rise to smaller variations in the greaseproof index from specimen to specimen of a given sample for a lot of paper that do the methods which involve the time required for the appearance of a small fixed number of spots. However, the general criterion of a small proper sample size is that the size of the specimen shall be large compared to the typical failure pattern. This sample size in many greaseproof papers would seem to be the equivalent of a circle three or four inches in diameter.

In any spot counting method, the greatest difficulty is to assign proper relative importance to the different capillary diameter distribution which are absorbed. If one chooses to correlate spot count methods with volume rate of flow methods, the best expected correlation would be with a properly weighed spot count which includes an indirect measure of the capillary diameters and the associated volume rates of flow through these several capillaries.

This was done and it was found that the volume rate of flow through the several capillaries is inversely proportional to the square of the time of filling the capillaries so that a weighted spot count would be expected to correlate best with rate of flow measurements when the increase in the number of failure spots in increasing time intervals would be given relative importance in proportion to the inverse square of the time interval in which the increase occurred.

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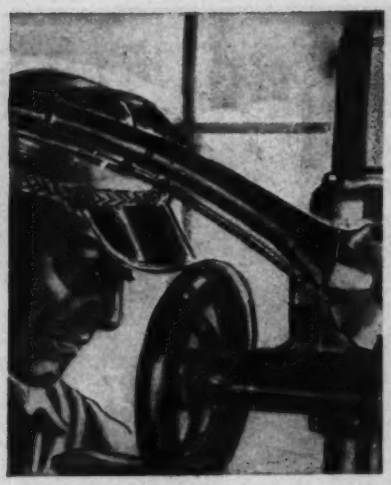

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Drying Rate for Kraft Paper*

A. E. MONTGOMERY, Western Manager
J. O. Ross Engineering Co.

Nine years ago, a report was made for the TAPPI Drying Committee on the drying rates for kraft paper (Montgomery, A. E., *Paper Trade J.* 86, No. 11: 32-35, March 16, 1933; *Tech. Assoc. Papers* 16:172-175, June, 1933). This was the first thorough study made on drying rates, and although the report was based on a substantial accumulation of data obtained through a survey of the kraft mills, studies made on other grades in later years caused the committee to believe that further data might modify the slope of the drying curves given at that time. Also it was realized that in these nine years a substantial number of new, high-speed, high-production machines had been installed in the South; that there had been a great increase in the production of fourdrinier kraft board, data on which was meagre in the earlier report; that several of the new machines differed from earlier ones in having a large proportion of the drying surface in felt dryers; and finally that the recent urge for increased drying capacity on kraft machines might have prompted the development of higher drying rates than found previously.

The form of drying questionnaire used is similar to the forms used previously. Data was requested only for fourdrinier machines making all sulphate paper and paperboard. The questions asked were:

1) Number of paper dryers
2) Diameter of paper dryers, inches
3) Number of felt dryers
4) Diameter of felt dryers, inches
5) Face width of dryers, inches
6) Arrangement of dryers (horizontal or vertical)? No. of tiers?
7) Condition of dryer surface (clean-fair-coated)
8) Do you use any special air system on the dryers or felts to aid in drying?

Separate columns were then provided in which were to be filled in answers to the following questions for (a) the sheet of paper or board found easiest to dry, or the one on which the best production was obtained, and (b) the sheet found hardest to dry or which gave the lowest production.

9) Classification of paper
10) Bleached or unbleached
11) Basis weight (give weight and basis)
12) Speed of machine, feet per minute
13) Steam pressure on dryers (if divided into more than one section give effective average, lb. per sq. in.)
14) Moisture in sheet (per cent) entering dryers (this figure is important)
15) Moisture in sheet (per cent) leaving dryers
16) Comments on any special condition not given above which would influence drying rate on this machine.

Thus two sets of data were obtained for each machine reported. It should be noted that we did not ask the daily or hourly production nor the trim, but have calculated the drying rate from the machine speed and basis weight.

(*) Contribution of the TAPPI Heat and Power Committee. This paper is based on a survey made by the Subcommittee on Drying, Heating and Ventilating.

For our purpose drying rate has been defined as the pounds of paper dried (R_p) or pounds of water evaporated (R_w) per hour per square foot of total paper and felt drying surface covered by the width of the sheet.

The total drying surface per inch of width:

$$S/W = 0.0218\ (N_p D_p + N_f D_f)$$

Where N_p and D_p represent respectively, the number and diameter in inches of the paper dryers, and N_f and D_f represent respectively the number and diameter in inches of the felt dryers.

The drying rate expressed in pounds of paper dried per hour per square foot of drying surface:

$$R_p = \frac{\text{Speed} \times \text{Weight}}{S/W \times K}$$

Where

Speed = Speed of machine in feet per minute

Weight = Standard ream weight of sheet

K = A constant depending on the ream size, and which for wrapping papers on a basis of 24 × 36 — 480 is 576 or for 1000 sq. ft. is 200.

For calculating the pounds of water evaporated per pound of paper dried (M), we have found the following formula most convenient and easily remembered:

$$M = OD/OD—1$$

where the OD above the line represents the percentage dryness of the sheet leaving the dryers (the large number), and the OD below the line represents the percentage dryness entering the dryers.

The drying rate expressed in pounds of water evaporated per hour per square foot of drying surface then becomes:

$$R_w = R_p \times M$$

A comparison of the tabulated and plotted data secured by the survey made this year with that which served as the basis for the earlier kraft drying rate report at once showed that there had been no material change, nor in fact any change detectable within a reasonable margin of error in sampling, in the drying rates of the two periods after making allowance for steam pressure.

There now seems good evidence that the slope of the curves is greater for lightweight papers than for kraft board or any paperboard. Putting it another way, the increase in drying capacity to be gained by increasing the steam pressure would be greater on lightweight or medium weight papers than on heavy board.

The new data on kraft afford definite proof that within the wide limits now run on fourdrinier kraft machines weight does have an effect on the corrected drying rates. For example data were received on five different machines for both 50- to 140-pound paper and 0.030 board. In each case a decidedly lower corrected drying rate (both R_w and R_p) is observed for the heavy kraft board. In a similar manner scrutinizing the data for machines having reports for light kraft paper and heavy paper there is a general agreement showing lower corrected drying rates for the light papers, although this is not true in every case.

The entering moisture content for heavy sheets is less than for lightweight sheets

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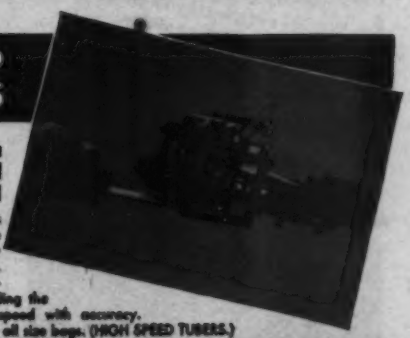

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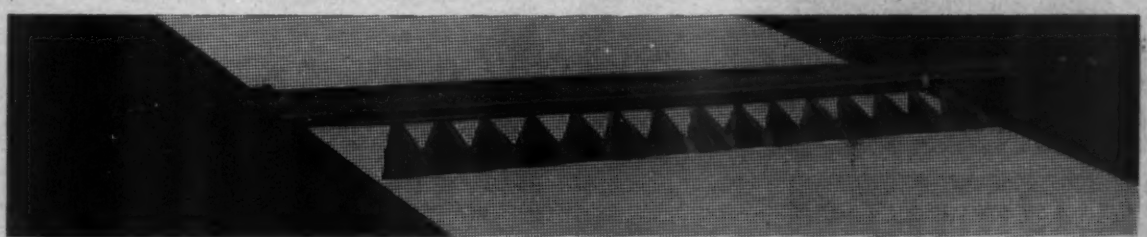

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as is to be expected. This year's survey shows the average entering moisture content for 20 sets of data for 100-pound and heavier paper to be 68.3 per cent whereas for lighter than 100-pound it is 70.7 per cent equivalent to 10 per cent more water to be evaporated in the lighter papers.

It is interesting to note that the average value as well as the better and poorer limiting values for water removal at the presses seem virtually unchanged in the nine years since the earlier report was made. We know improved water extraction equipment has been installed on numerous machines, but perhaps the average benefit has been offset by the increased length of the dryer sections and consequent increased speed which makes water extraction at the presses more difficult. Considering the importance of the entering moisture content as it affects drying capacity and drying costs is it not surprising to find the poorer machines have 60 per cent more water to evaporate per pound of paper than the better machines with the same weight and grade of paper?

It may be of interest to have the average data for all the 31 machines reported. This composite average kraft machine has the equivalent of 44 60-inch diameter or 55 48-inch diameter paper dryers and 8.6 48-inch felt dryers, all 182-inch face width. It would be running at 676 f.p.m. on 87-pound kraft paper using 29 p.s.i. steam pressure, drying paper from 70 per cent entering moisture content, to 6 per cent leaving moisture content, evaporating 2.1 pounds water per pound of paper, giving a production drying rate (R_p) of 1.08 and an evaporative drying rate (R_w) of 2.26.

In view of the keen attention kraft mill operators in recent years have given to getting the utmost machine production, a closer uniformity from these new data was expected. Reference to the drying rate curves show the better machines having twice the drying rate of the poorer ones for the same steam pressure, of after correcting for steam pressure having twice the drying rate for the same weight of paper. Obviously there must be other serious factors influencing drying rate besides steam pressure and weight of paper. Though important, these are hard to evaluate. The machine enjoying a high drying rate must have a favorable position with respect to most or all of these factors, whereas the machine with a definitely low drying rate is likely to be suffering an unfavorable condition for most of them.

With respect to the physical proportions of the machine itself doubtless the drying rate is affected by the diameter of the dryers, their spacing and arrangement, and the proportion of felt dryers. Little seems definitely known of these factors. The condition of dryer drainage and especially the removal of air and noncondensable gases from inside the dryers is important, and probably accounts to a considerable extent for the wide variation in the drying rates at any given steam pressure. The tightness of the dryer felts and the tightness and uniformity of the paper draws are important factors. The smoothness of the sheet as it contributes to intimate contact with the dryer surface undoubtedly is highly important. Still other factors are the condition of the inside and outside dryer surface, especially the latter.

The ventilation around the machine as it affects the air conditions immediately adjacent to the paper and felts is well known to have a considerable influence on drying rates. The use of special equipment to provide positive ventilation of the dryer pockets will improve drying capacity.

The entering moisture content has a decided effect on the production drying rate, although little on the evaporative drying rate. The final moisture content to which the paper or board is dried has more effect on drying rate than is commonly realized, not because it has much to do with the total amount of water actually evaporated but because the final moisture removal is at a much reduced drying rate as compared to the average. Even drying across the width of the sheet and good steam control permitting of drying allows for higher drying rates. The aim should be to have all these favorable factors acting together.

A Comparison of the Capillary Flow and Falling Sphere Methods of Determining the Viscosity of Cellulose in Cuprammonium Solutions

R. S. HATCH[1], R. N. HAMMOND[2], and J. J. McNAIR[3]

The determination of the viscosity of cellulose in cuprammonium solutions is in general use among manufacturers and consumers of cellulose both as a measure of uniformity of product and as a measure of degradation which may take place in the processing of the cellulose.

Of the many methods for the determination of viscosity, there are two which are in general use for the determination of the viscosity of cellulose in cuprammonium solution. One is the capillary flow method which has been adopted and standardized by TAPPI. The other is the falling sphere method which has been standardized and adopted by the Cellulose Division of the American Chemical Society (A.C.S.).

In the course of our research work on the cooking, bleaching, and purification of various pulps, it was necessary to follow the various steps in the process by accurate measurements of viscosity to determine the amount of degradation occurring at each step. When we attempted to use the capillary flow method for determining the viscosity of unbleached or partially bleached pulps, our inability to obtain duplicate results on a given sample compelled us to make a thorough investigation of other methods in use and finally led to the modifications which are described in detail in this paper.

The TAPPI Standard Method is based on work done by Clibbens and Geake (Clibbens and Geake, *J. Textile Institute* 18:77-92, 1928) in England. The method proposed by these authors was modified by Bialkowsky (Bialkowsky, H. W., *Tech. Assoc. Papers* 13:195-200, May, 1930) and was adopted as the official standard by TAPPI April 15, 1933, and is designated as Standard T 206 M-37.

(1) Director of Research, (2) Research Chemist, (3) Research Chemist, Pulp Division, Weyerhaeuser Timber Company.

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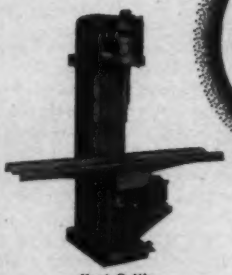

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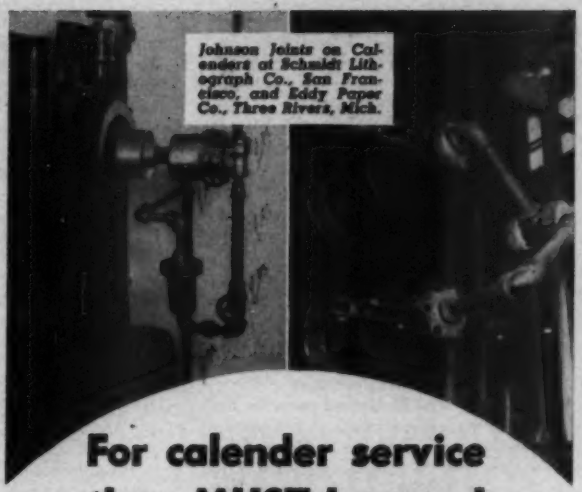

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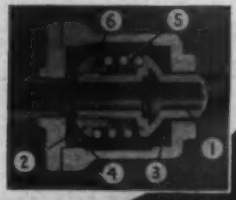

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At the time we were carrying on our investigation of viscosity determination, our control laboratory was also investigating the cause of irregular results obtained when working with cuprammonium solutions prepared according to the tolerances established in the TAPPI. Both our control laboratory and our research laboratory concluded that much closer tolerances were necessary in the preparation of the cuprammonium solution. In the research laboratory, we established a copper concentration of 15 ± 0.1 grams per liter and ammonia concentration of 200 ± 1 gram per liter, nitrates less than 1 gram per liter and sucrose, 1 gram per liter. Having established standard concentration of cuprammonium solution, we next investigated the preparation of the solution. The TAPPI method proposes bubbling air through a column of copper turnings covered with ammonia and contained in a glass tube 24 inches long and 4 inches in diameter and kept surrounded with ice during the dissolving period. We modified this method to some extent in that we packed our copper turnings in a piece of streamlined copper pipe and carried out the dissolving process at room temperature. By surrounding the tube with a freezing mixture, it is easily possible to increase the copper concentration to 40 grams of copper per liter. In preparing our standard cuprammonium solution, no difficulty was experienced in obtaining the copper and ammonia concentrations desired in one and one-half to three hours with an air rate of 30 liters per hour, using 1 gram of sucrose per liter to insure ready solution. Under these conditions, the solution, after adjusting to standard copper and ammonia concentrations, contains less than 1 gram of nitrates per liter. In preparing cuprammonium solutions by the method just described, it is found necessary periodically to clean the copper surface to insure the proper rate of solution and to see that ample surface of clean bright copper is exposed.

Having established a standard cuprammonium solution, the reproducibility of the capillary flow method with various types of pulps was investigated. It was possible to get reproducible results on fully bleached pulps but with unbleached pulps or partially bleached pulps there often was sufficient undissolved material in the solution to cause partial plugging of the capillary and we had great difficulty in obtaining check results on the same pulp.

Because of the inherent difficulties in obtaining not only satisfactory reproducibility but also true viscosity determinations by use of the capillary flow method on unbleached pulps and on pulps of relatively high viscosity, a study was made of the method proposed by the A.C.S. This method is based on the time required for a sphere of standard size to fall through a standard depth of the dispersion of cellulose in the cuprammonium solution. The falling sphere method for the determination of viscosity is a well known and universally used method for viscosity determination. It is based on Stokes' law and may be calculated directly from Stokes' law as modified by Ladenburg (Ladenburg, *Annalen Der Physik* vol. 22, p. 287), provided the ratio of the diameter of the sphere to the diameter of the vessel containing the solution is within the limits of Ladenburg's correction. Ladenburg, however, states in his original study that the ratio of the diameter of the vessel containing the liquid, the viscosity of which is to be measured, to the diameter of the sphere used must be not less than 30 to 1 if his correction it to be applied. The A.C.S. method establishes the diameter of the tube as 1.4 ± 0.05 cm. and the diameter of the sphere as 3.175 ± 0.05 cm. It is obvious that the Ladenburg correction to Stokes' law cannot be applied in this case. The method, therefore, uses an oil of precise viscosity as obtained from the National Bureau of Standards for calibration purposes and the tube constant is determined according to the following formula:

$$\eta = KT(D-d)$$

η = Viscosity

where

K = A constant for tube and sphere
T = Time of fall
D = Density of glass sphere
d = Density of the oil.

The necessary steps to be taken in dissolving the cellulose sample are described in detail in the analytical edition of the *Journal of Industrial and Engineering Chemistry*, January 15, 1929, page 49.

Having determined the reproducibility of results on all types of pulp when using the falling sphere method, we then endeavored to simplify the preparation of the cellulose solutions in order to avoid the rather cumbersome and time consuming process of the A.C.S. method. The TAPPI method avoids the use of an inert gas by dispersing the cellulose in a tube completely filled with cuprammonium solution. This tube is the capillary tube used for the determination. After careful study, a tube was designed which could be used either for the falling sphere method or for the capillary flow method. It was necessary to change the design of the steel wedge of the standard TAPPI design to bring about complete dispersion of solutions of higher than 1 per cent concentration. A standard taper, ground-glass stopper equipped with a capillary tube is used instead of rubber stoppers in order to insure absolute duplication of volumetric capacity. The stoppers and tubes are numbered and the volume of each tube with its stopper is accurately determined. The following procedure is followed in preparing the samples and bringing about the dispersion:

(1) The pulp to be tested is made into a sheet, pressed, and air dried.

(2) The sheet is then cut into thin strips approximately ⅛ inch by 3 inches.

(3) These strips are stored in a closed bottle and the moisture content determined.

(4) The per cent cellulose solution which will give a time of fall of from 5 to 30 seconds is estimated and the pulp added to the tube to be used in the test.

The tube is closed at the bottom with a rubber tube and metal clamp and at the top with a rubber tube containing a glass bead slightly larger than the bore of the tube. The ground glass stopper is slightly greased to prevent seepage.

The tube is then filled from the bottom

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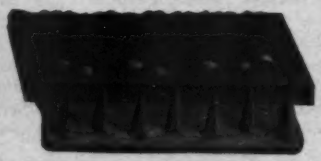

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with the standard cuprammonium solution using nitrogen pressure to fill.

(5) The pulp cuprammonium mixture is clamped in a revolving agitator turning at 4 rpm and agitated for 16 hours in the absence of light.

(6) At the end of 16 hours agitation, the tubes are placed in a constant temperature bath for at least 1 hour at 20 C. after which the tubes are removed from the bath and placed in a constant temperature jacket with a fluorescent light background. The glass stopper is removed and the time taken for the standard sphere to fall between two lines etched on the tube exactly 15 cm. apart. Because of the difference in design of the steel wedge, it is necessary to remove this wedge when determining viscosity by the capillary flow method. This is easily done by pulling out the wedge with an electromagnet before the capillary flow test is made.

As has been mentioned above, the A.C.S. method uses a tube which is 1.4 cm. in diameter and a glass sphere which is 3.175 mm. in diameter. The tube which we have adopted for both the falling sphere and capillary method is 1 cm. in diameter and we have adopted as standard an aluminum sphere 1/16 inch in diameter. These aluminum spheres are made by several ball bearing manufacturers and are entirely of domestic origin. Their specific gravity is constant and they are ground to very close tolerance. It is, therefore, unnecessary to make repeated and careful determinations of specific gravity. Furthermore the specific gravity of the aluminum sphere is low enough to obtain satisfactory time intervals on pulps of medium viscosity in 1 per cent solution.

The A.C.S. method uses a cuprammonium solution having a copper content of 30 grams per liter and an ammonia content of 165 grams per liter. Experience with this solution indicates that it is not as stable as the solution which we have adopted as standard: namely 15 grams of copper per liter and 200 grams of ammonia per liter. A comparison of the A.C.S. method with that which we have described is given.

A.C.S. Method

(1) Results expressed over a range of at least two scales
(2) Results show greater differences as they are usually expressed at 2.5 per cent concentration
(3) Dissolving solution is somewhat unstable
(4) More apparatus and more solution
(5) Cuprammonium-cellulose solution must be transferred when dissolved
(6) Large quantity of cellulose weighed decreasing weighing errors
(7) Dissolving liquor measured in pipette involving possible errors
(8) Elimination of oxygen from dissolving bulb is difficult
(9) Long time required per sample

Research Department Method

(1) Results reduced to 1 per cent comparison over the whole range
(2) Results expressed at 1 per cent
(3) Dissolving solution very stable
(4) Small amount of apparatus
(5) Viscosity is determined in the dissolving tube involving no transfer of solution
(6) Small quantity of cellulose
(7) Tube completely filled with dissolving liquor
(8) No oxygen problem
(9) Short time required per sample

The Chemical Industries As Potential Users of Paper Containers

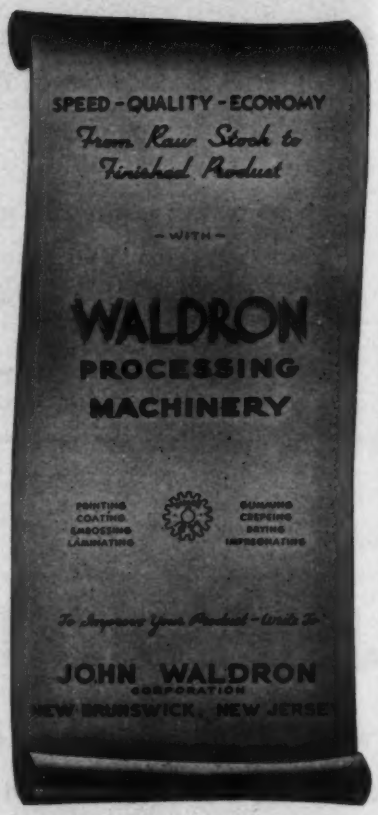
R. W. LAHEY
American Cyanamid Company

Safety of the public and protection for the employees of the transportation agencies often may require that special safeguards be built into containers which are to transport explosives, inflammable liquids or solids, corrosives, poisons, and gases. In fact, there are many products in each of these classifications which require individual treatment as to containers and handling.

These conditions lead to a co-operative effort on the part of the manufacturers in the industry to develop safe containers. Another aim was to aid the Bureau of Explosives and the Interstate Commerce Commission (I.C.C.) in the development of proper regulations and the formation of safe container specifications. We, therefore, have a Carboy Committee; a Metal Barrels and Drums Committee; a Poisonous Articles & Miscellaneous Packages Committee; and a Tank Car Committee in the Manufacturing Chemists' Association.

The personnel of these committees is made up of specialists from companies who are members of the Manufacturing Chemists' Association. These committees have been in existence for over twenty years and their records demonstrate their accomplishments.

Early last year the Executive Committee appointed a Container Standardization Committee to co-ordinate the industries' containers with the war program. This committee has two objectives. First, to rearrange containers so that they will square with the defense program. For instance, we are attempting to conserve critical materials of fabrication; such as steel and burlap. The second objective is to insure a supply of containers by reducing the number of sizes and types and, at the same time, changing them to those types more readily obtainable.



This work of standardization of containers fits in with the objectives of the Industrial Conservation Bureau of the WPB.

Several of the proposed changes lead to the field of paper containers and it is expected that the paper industry will assume this added burden as the products to be carried are essential to defense. The substitution of paper containers in many instances will replace steel. The Standardization Committee is anxious to work with fabricators of paper containers if they desire to help in the required technical development work.

The paper industry is a good and valued customer of the chemical industries, and it has been apparent for some years that there is a good market for paper in the container requirements for chemicals.

The industry may be divided into two groups. First there is the drug, medicine, paint, and insecticide group which packs its products in small shelf or retail packages. This group is far advanced in the use of paper for set-up and folding boxes, bags, envelopes, cushioning materials, labels, corrugated and solid fiber shipping containers and fiber drums. The second

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group packs its products in the so-called bulk containers. The container requirements of this group are not so well known. It ships its products in large units to processing factories. This market warrants the careful consideration of paper container fabricators.

The necessary strength and protective qualities of a container required to get the product to its destination in good condition is only one of the problems to be reckoned with. Protection from dirt and dust, and contamination from other foreign materials is very important for some products. Protection against the absorption of water vapor or the loss of moisture may be essential. Acid or alkalies may react with the container material. Finely powdered materials do not require the strength in the container that granular or lump materials need.

There are other considerations, such as the type of container which can be conveniently fitted into the production equipment and storage facilities and also the customers' requirements for dispensing, handling, etc. Under such conditions, it is doubtful if your standard constructions of containers can be satisfactorily adopted by chemical producers. Often it is necessary to "tailor make" a container for the product. This is no more than what you have done for fragile articles when shipped in fiber board shipping containers. In these containers, you have developed interior packing for suspending each type and kind of fragile article in the fiber board box and you have had to prove the protective qualities of your container.

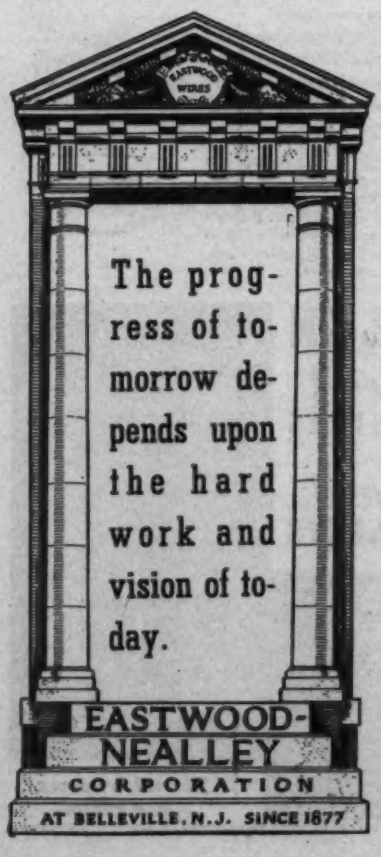
Several attempts have been made to obtain corrugated or solid fiber boxes to replace barrels. In only a few instances are such containers now used, one of which is for the metallic stearates. Anyone familiar with this package knows that it is one of the poorest in our industry. In the last few years a few fiber box manufacturers have developed drums for this purpose. These are not the convolutely wound drums, which of course are too expensive to compete, but are solid fiber or corrugated drums with stitched cylindrical seams.

Multiwall paper bags have already taken some of the barrel business, but there are some products where there is a distinct advantage in using a rigid container.

There is a need for more adequate moisture resistant linings for fiber drums, bags, and boxes. The development of a better lining which will not be prohibitive in cost may open up many additional possibilities for these containers.

The development of multiwall paper bags of greater strength, particularly in their resistance to snagging and having more protective qualities against contamination of any type, will also increase the market for these containers.

You can render a great service to the chemical industries if you will develop an accurate test to measure the relative transmission of moisture vapor through containers fabricated from paper and paperboards. We desire a laboratory test which will foretell relatively the transmission of moisture vapor through a container under actual storage, handling and transportation conditions. This involves varying the relative humidity and temperature, as well as the testing of the container after it has been handled.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Alkaline Purification of Cellulose

G. GOLDFINGER and H. MARK
Polytechnic Institute of Brooklyn

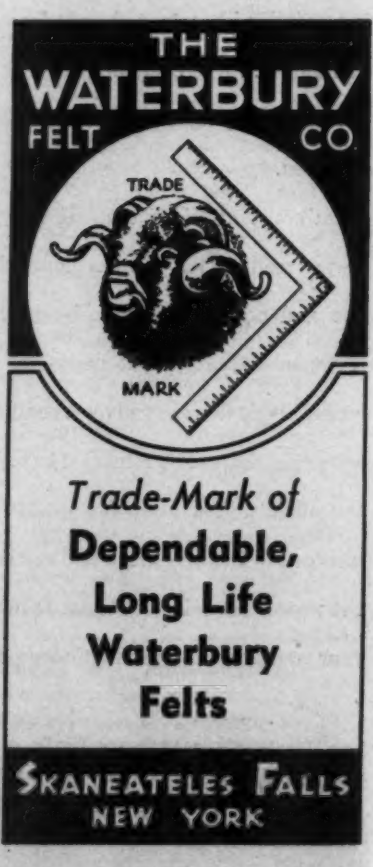
Various samples of bleached wood pulp and cotton linters were treated in 17.5 per cent NaOH solution at 20 C.; 100 cc. of solution was used per gram of dried pulp. The treatment lasted for various times up to 168 hours.

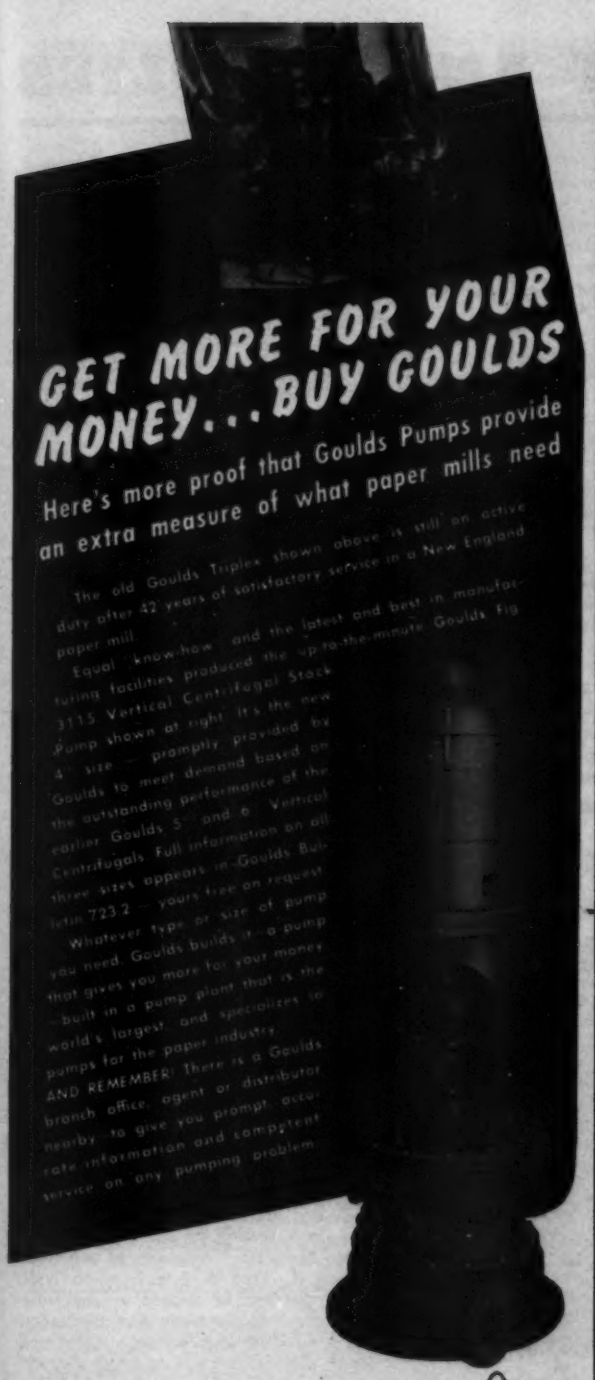
The pulp was defibrated in the solution in the way prescribed for the (TAPPI) standard alpha-cellulose test, kept there for various lengths of time and subsequently filtrated in an aluminum crucible, washed with 8 per cent NaOH solution, 10 per cent acetic acid and water, and finally dried at 107 C. The loss of weight was determined by difference. The method as described was similar to the standard test except that the treatment lasted different lengths of time and that when the sample was brought into contact with the NaOH solution, a vacuum was applied for a short period in order to speed up the penetration of the solvent in the sample and to eliminate the atmospheric oxygen as much as possible.

A sample of each treated and untreated pulp was dissolved in cuprammonium solution (according to the TAPPI standards) and its specific viscosity determined in a concentration of 0.1 gram of cellulose in 100 grams of solution. These determinations were carried out in an Ostwald viscometer at 20 C.

The experimental results indicate the coexistence of two main elementary reactions: namely, the dissolution of the lower molecular weight fractions of the cellulose, important mainly at the beginning of the process and the degradation of the cellulose, whose effect becomes more and more predominant as the reaction progresses. The dissolution of a part of the material is indicated by the loss of weight of the total sample. The initial increase of the specific viscosity at the same time proves a shift of the distribution curve toward the higher molecular-weight side, thus showing that, as it has to be expected, the low-molecular weight fractions are the ones which go more readily in solution. The effect of degradation on the other hand is shown by the successive lowering of the specific viscosity which does not reach a constant value even after 170 hours of treatment.

Recent work of Jackson and Hudson (Hudson, C. S., Jackson, E. L., *J. Am. Chem. Soc.* 59, 2049, 1937; 60, 989, 1938), Davidson (Davidson, G. F., *J. Text. Inst.* 32, T109, 1941), and Kenyon and collaborators (Kenyon, O. W., Yackel, E. C., *J. Am. Chem. Soc.* 64, 121, 1942) give an excellent tool to attack the problem of the nature of degradation more thoroughly than before. Further experiments should reveal whether the rate of degradation is essentially a function of the distribution curve or of the presence of more or less chemically weakened bonds or both.





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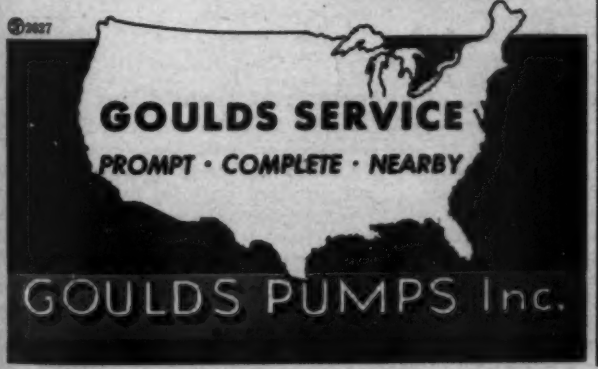

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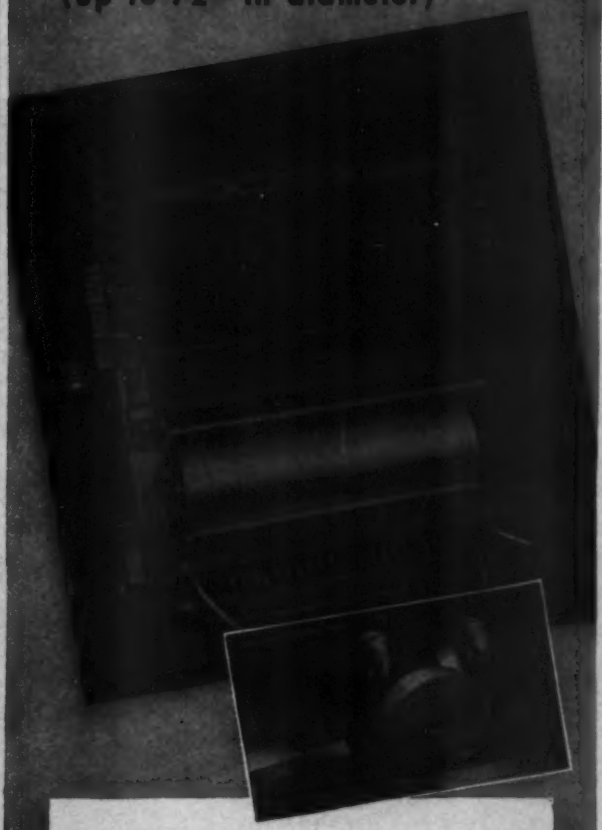

THIS MACHINE is designed especially for high-speed low cost production of narrow width paper board rolls up to 72" in diameter. Camachine 10-14D operates at speeds up to 1500 F.P.M. and slits rolls to as narrow as ½" in width. Finished rolls up to 50 inches in diameter can be produced on the standard model Camachine 10-14D. At extra cost the same machine can be equipped to handle rolls up to 72 inches.

Special features adapted especially to paper board mill requirements are the water-cooled mil roll brake, and the large diameter rewind drums which avoid cracking the web when threading up the machine.

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MIDWEST OFFICE: Harris Trust Building, 111 West Monroe Street, Chicago

NEW EQUIPMENT AND SUPPLIES

Conveyor Belt Idler

Chain Belt Co., Milwaukee, Wis., has announced a self-aligning idler (both return and carrying) for flat conveyor belts. The idler tends to swivel in a horizontal plane whenever the belt runs to one side. If this movement is insufficient to return the belt to its normal traveling position, the belt will continue traveling to one side until it

contacts a counterweighted end disc. This disc, slightly larger in diameter than the idler roll, produces a counter-force on the idler, causing it to swivel rapidly and thus forcing the belt to swing back the other way.

The manufacturer states that a number of idlers of this design, spaced at intervals between the stationary idlers, will automatically return a belt in excessive misalignment to its central position.

Acid and Alkali Resistant Paint

The Harrington Paint Co., Inc., 1630 Collamer Ave., Cleveland, Ohio, has announced Rust-Eeter 66, an acid and alkali resistant paint. Made from domestic waxes, in Indian red color, the paint dries very quickly. Several coats may be applied in a day. It requires no priming coat for application. The paint will adhere to iron, steel, non-ferrous metals, wood, stone, cement, etc. It covers 400 to 500 square feet of surface per gallon.

Synthetic Wax

A synthetic, tan-colored wax with a melting point of 46-49 C. has been announced by the Glyco Products Co., Inc., 230 King St., Brooklyn, N. Y. Designated as *Nipocer*, this wax is stated to blend with most waxes and resins and to emulsify easily with the usual emulsifying agents. In addition, the manufacturer claims that the wax is superior to Japan wax in that it is always uniform and is less subject to oxidation and rancidification.

Asbestos Protective Suit

Mine Safety Appliance Co., Braddock, Thomas and Meade Sts., Pittsburgh, Pa., has announced a new *M. S. A. One-Piece Asbestos Protective Suit* designed to prevent entry of flame, to insulate against heat, and to guard the head from injury by falling or flying material. The suit consists of an upper- and lower-garment sewed together with helmet, gloves, and boots attached.

The helmet is a laminated-Bakelite Type R Skullgard Protective Hat, asbestos-covered, and with front and rear aprons to protect the head and neck. A heat-resistant glass window in the hood provides ample unobstructed vision.

A zipper opening extends down the front from neck to waistline. When closed, the zipper is protected by a flap held in place by two arctic buckles. There also are zipper fasteners at the wrist and lower sections of outside leg seams.

Wrists, ankles, gloves and neck portion are flannel-lined for comfort. Sole and heel of boots are reinforced with asbestos brake lining material, riveted in place.

The suit is made in a universal size only, with tabs at each side and back to adjust length.

Hand-Wiping Safety Solvent

The Curran Corp., Malden, Mass., has developed a solvent as a naphtha substitute for grease cleaning and hand-wiping operations. Designated as *Gunk XP-92*, this solvent, according to the manufacturer, leaves an invisible rust preventative film on the degreased metal surface; also, it does not de-oil the skin, and has no toxic vapors and no flash or fire point.

Standard Covers for Antifriction Bearings

R-S Products Corp., 4530 Germantown Ave., Philadelphia, has announced the development of a line of standard covers for ball and roller bearings. Available in a

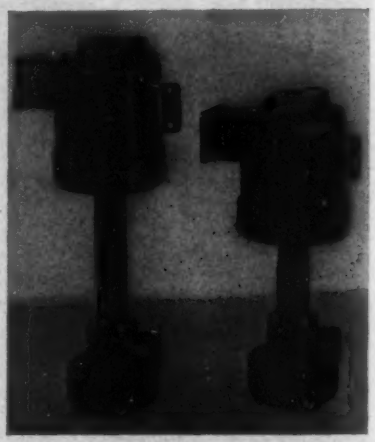
complete range of types and sizes, the chief advantages of the covers, according to the manufacturer, include: low unit cost, saving of costly "nuisance" set-ups, and elimination of costs of patterns, fixtures, gauges, etc.

Furnace Door

Plibrico Jointless Firebrick Co., 1800 Kingsbury St., Chicago, has announced a furnace door with an insulating door liner. The liner is *Plicast L-W-I*, a lightweight refractory material. Another feature of the door is a handle, designated as *Lock-Tite*, which is stated by the manufacturer to lock the door so tightly that all infiltration of excess air around the door is eliminated. The door is available only in right-hand opening style, the door frame being 27 in. wide by 24¾ in. high.

Coolant Pump

Eastern Engineering Co., New Haven, Conn., has announced a coolant pump for use on lathes, shapers, milling machines, grinders, etc., where a steady stream of coolant or cutting oil is necessary. The pump



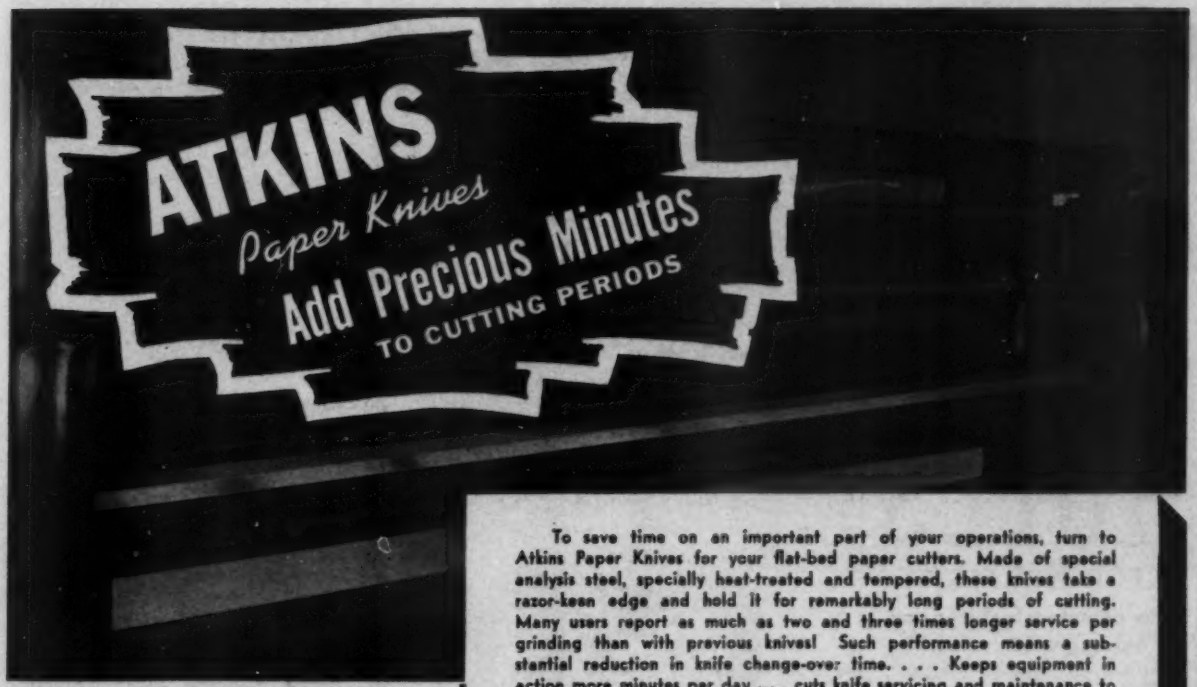
also is suitable for circulating non-viscous liquids for cooling and circulating applications. Of the centrifugal type, the pump, constructed of cast iron, is made in two heights (19¾ in. and 16¾ in.); is equipped with a ⅛ hp. motor; is tapped for 1¼ in. standard pipe above the impeller, ½ in. standard pipe at outlet; and has a maximum capacity of 17 gallons per minute, a maximum pressure of 6 lb. psi.

Protective Coating for Tanks

Protective Coatings, Inc., 10391 Northlawn, Detroit, Mich., has announced an acid- and alkali-resistant material, *Chempruf*, as a coating or lining material for tanks, ducts, etc. Available in two types, A and B, Type A is a brush-on heavy liquid that can be applied by any workman; Type B, a plastic that hardens to withstand heavy duty service, applied only in the manufacturer's plant or by the manufacturer on location. The softening point of *Chempruf* is given as 300 F.; the melting point, 510 F.

Industrial Humidifier

Carrier Corp., Syracuse, N. Y., has announced an industrial humidifier under the designation of Type 43 G. This unit not only humidifies the air but also cleans, circulates, and eats it during winter. Likewise, it may be operated in summer to provide evaporative cooling, cleaning, and circulating of air. Available in two capacities, the humidifier will provide 4800 or 6150 cu. ft. of humidified air per minute, and evaporate up to 96 lb. of water per hour.



To save time on an important part of your operations, turn to Atkins Paper Knives for your flat-bed paper cutters. Made of special analysis steel, specially heat-treated and tempered, these knives take a razor-keen edge and hold it for remarkably long periods of cutting. Many users report as much as two and three times longer service per grinding than with previous knives! Such performance means a substantial reduction in knife change-over time. . . . Keeps equipment in action more minutes per day . . . cuts knife servicing and maintenance to a minimum. Write for Atkins Booklet on Knife Care, containing many useful tips on best knife grinding practice.

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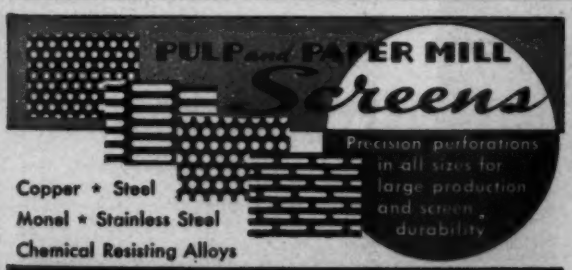

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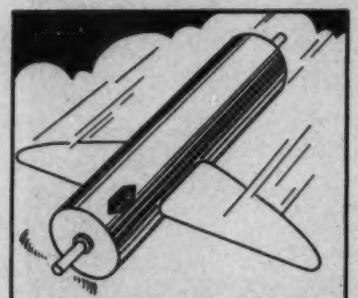

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FOR WET FELTS

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Process Extends Latex Volume

A process that extends the volume of latex from 50 to 300 per cent, depending upon the use to which the extended product is to be put, has been announced by Laboratory E, Union Bay State Co., 50 Harvard St., Cambridge, Mass. According to the announcement, the process makes use of a filler material of such fine size that it blends extremely well with the rubber particles; that the extended product responds to the same reagents, has the same wetting-out properties, and penetrates and dries in the same manner as latex; and that the extended product even is susceptible to vulcanization.

Lead-Base Bearing Metals

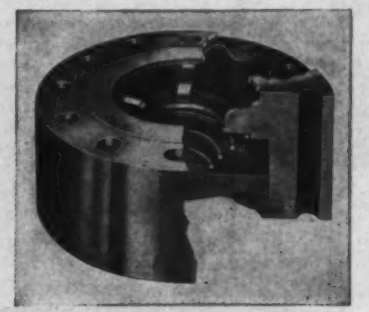
Magnolia Metal Co., 120 Bayway, Elizabeth, N. J., has announced the development of two new lead-base bearing metals as substitutes for tin-base babbitts. Respectively designated as *Pyramid Metal* and *Defender Metal*, the first, according to the manufacturer, is well suited to applications where bearings must withstand heavy sustained pressures, such as are found in paper mill calender stacks; the second, to crusher and sifter machinery applications, because it stands shocks without cracking.

All-Position A-C. Arc Welding Electrode

An all-position, alternating-current, welding electrode, designated as Type W-26, has been announced by the General Electric Co., Schenectady, N. Y. According to the announcement, this electrode compares favorably with the highest quality vertical and overhead welding characteristics available from reverse polarity direct-current electrodes; and complies with the requirements of the following specifications: A. W. S. Filler Metal Specification E6011; Navy Bureau of Ships Specification 46E3, Grade 3, Class 1; and the A. S. M. E. Boiler Code; Paragraph U68. It is now available in 1/8 in. and 5/32 in. diameters; other sizes from 1/16 to 1/4 in. are expected to be available shortly.

Check Valves

The Williams Gauge Co., 2030 Pennsylvania Ave., Pittsburgh, Pa., has announced an improved line of check valves under the designation of *Williams-Hager Flanged Silent Check Valves*. Manufactured of bronze, cast iron, steel, stainless and



Monel metal for pressures varying from 150 to 2500 lb., the valves are made in sizes ranging from 1 to 20 in. inclusive. In general, the valves, according to the announcement, may be used in all pump lines handling water, oil, gas, acids, alkalies, and other fluids.

Chemical Proportioner

Graver Tank & Mfg. Co., Inc., East Chicago, Ind., has announced a chemical proportioner for providing accurate control of the feed of chemicals into a water treating plant in proportion to the water volume.

Adapted to any make of solution type of chemical feeder permitting installation of swing pipe or skimmer, the proportioner, according to the manufacturer, permits instant increase or reduction of chemical charge over a wide range should the water require it.

Rotary-Centrifugal Dual Pumping Unit

Blackmer Pump Co., Grand Rapids, Mich., has announced a combination rotary-centrifugal dual pumping unit for use where two dissimilar liquids must be handled through one pumping unit. The rotary pump has a capacity of 44 gpm at 50 psi, handling fuel oil; the centrifugal pump, 75 gpm at 25 psi, handling water. The new unit is mounted on a cast bedplate, and is powered by a 4 hp, 3 phase 60 cycle motor with a gear head on one end to drive the rotary pump, and a shaft extension on the other end, direct-connected to the centrifugal pump.

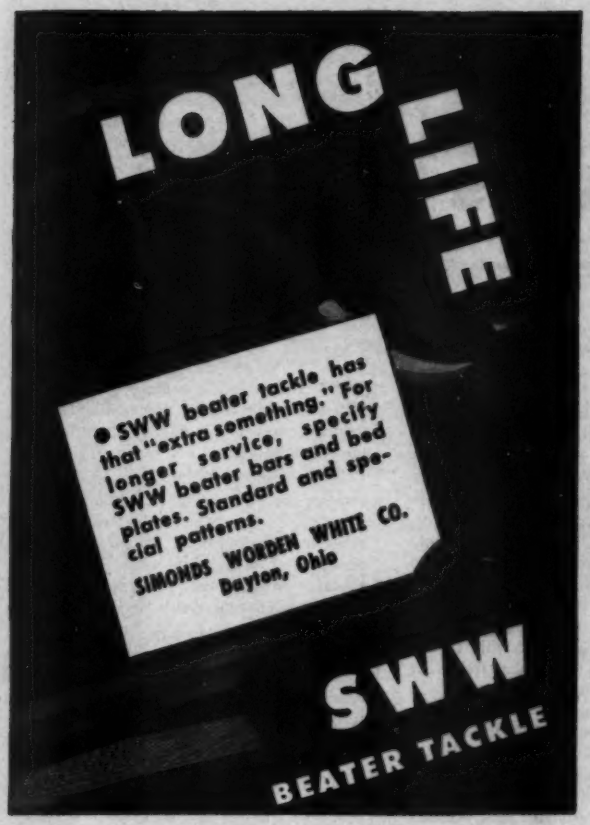
Incendiary Bomb Extinguisher

Buffalo Fire Appliance Corp., 44 Central Ave., Buffalo, N. Y., has announced a pump-tank type of extinguisher for use in combating incendiary bombs. The extinguisher constructed of galvanized steel and painted red, is supplied in two capacties, 2½ and 5 gallons, the latter size being

recommended by the manufacturer for general industrial applications. Among the features of the design, cited by the manufacturer, are: double-action pump that assures adequate water pressure to fight bomb at a safe distance; a large re-fill opening at top which facilitates quick replenishing of water during operation if necessary; and easy portability.

General Utility Sealing Compound

Duxseal, a non-hardening adhesive sealing and caulking compound suitable for a wide range of uses, has been announced by Johns-Manville, 22 E. 40th St., N. Y., N. Y. The material, according to the manufacturer, is insoluble in water, is unaffected by ordinary gases and condensates, will not hurt the hands, and sticks readily to any clean surface without slumping, flowing, or hardening in service. It is black in color, weighs 100 lb. per cu. ft., and is furnished in 1 lb. and 5 lb. pugs, in cartons of 60 and 12 pugs respectively.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Ask For These Graver Bulletins

Bulletin 301. Pictures and describes Graver Pressure Filters. Explains general construction and contains specification tables for both horizontal and vertical types.

Bulletin 303. Fully describes the Graver Hot Process Water Softener. Also contains detail drawings of two types of equipment plus other interesting information.

Bulletin 307. Covers Graver Zeolite Water Softeners as well as six types of Graver Zeolites. Contains a series of six interesting flow diagrams covering softening of water with Graver Zeolites.

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TECHNICAL DEVELOPMENTS

These abstracts are of the latest developments found in the American and foreign press.

Cellulose Viscosity in Dimethyldibenzylammonium Hydroxide (*Triton F.*)

This method, which was previously described in Ind. Eng. Chem. [Anal. Ed., 12, 151 (1940)] has been investigated further. In the earlier paper the authors (W. W. Russell and N. T. Woodberry) suggested that this method is simpler and faster than the cuprammonium hydroxide method. In further studies (in the present paper) the effects of dissolved gas, stirring in the open, normality of solvent, air (and oxygen), temperature, and time were noted. When (cotton) celluloses were only slightly degraded (with a cuprammonium viscosity of 25 or greater) the advantageous aqueous solvent concentration is 2.1-2.2 *Normal*. This should not interfere with the sensitivity of the method. The temperature during solution should be kept within a few tenths and the actual viscosity measurements within a few hundredths of a degree. By placing a bell jar over the dissolving cellulose, an atmosphere of fixed aqueous vapor pressure can be obtained, and changes in concentration are minimized. When the solution is carried out under nitrogen, the viscosity values are 4-5 per cent higher, and "aging" takes place more slowly. This aging process after solution takes place at an approximately linear rate. With degraded celluloses (cuprammonium viscosity 25 or less) a cellulose concentration of 0.5 per cent may be used, but for less degraded celluloses, a lower concentration is required to avoid highly viscous solutions. Ordinarily a 0.25 per cent cellulose solution is satisfactory. A discussion is given for conversation factors from cuprammonium to dimethyldibenzylammonium hydroxide viscosities. W. W. Russell and L. N. Hood, Ind. Eng. Chem., Anal. Ed., 14, 202 (1942).

Hardwood Cellulose

The average degree of polymerization (d. p.) in non-lignified plant materials is about 2,000-3,000, according to Staudinger. Since the viscosity (and correlated d. p.) drop during the cooking process, careful delignification is essential. ClO_2 (the reagent used by Erich Schmidt) appears suitable for the removal of lignin without the serious degradation of the polysaccharides. The overall d. p. of "aspen cellulose" and "oak cellulose" (hitherto reported as 1,400 and 1,000 respectively) cannot be compared directly with that of native cellulose, since other polysaccharides are present in the wood cellulose.

In general, Schmidt's procedures were followed in preparing high viscosity wood cellulose, and for obtaining alkali-soluble material. However, in a part of this study, the middle lamella of the wood was softened sufficiently to cause easy defibration, and the lignin was removed by chlorination. Xylan was extracted from the residue with 5 per cent caustic soda, and the cellulose thus obtained showed a d. p. of 1,700-1,800 (the Swedish abstractor speaks here of "cellulose substance", but the implication is that this is the alkali-insoluble residue).

Returning to the ClO_2-pyridine treatment, which causes less degradation, the author obtains hardwood celluloses of d. p. approximately 2,000. (Here presumably alkali-soluble material was removed prior to the determination, although this is not specifically stated in the abstract). In other words, these average cellulose d. p.'s are approximately equal to those of non-lignified, native cellulose. (W. Klauditz, Papier-Fabr., 39, No. 39, 225, 1941, through Svensk Papperstidn, 44, No. 24, 558, Dec. 1941 and Bull. Inst. Paper Chemistry, Vol. 12, No. 10, June, 1942.)

Cellulose and Lignin Research During 1941, in Sweden

This article gives a report of activities of the Stockholm Cellulose Laboratory. Briefly some of the items stressed are given in the following abstract:

(A) Two technical methods for the conversion of cellulose to sugars have been carried out on a technical scale through hydrolysis either with strong sulphuric or hydrochloric acids. The former acid gives sugar fit for fermentation, while the latter gives a product that can be used as a foodstuff for humans. Wood, while cheaper, does not lend itself as readily or as economically to hydrolysis as does cellulose. The methods described could probably be applied rapidly if sudden demands for these products were made.

(B) Further studies were made on the chemistry of the sulphite cooking process, both with regard to the properties of lignosulphonic acid and the changes of the lignin-carbohydrate compounds during the cook. Sodium bisulphite cooks were followed, at low H-ion concentrations. For each 20 carbon atoms (in the main part of the lignin) there was 1 sulphur atom and 2 methoxyl groups, which indicates the presence of a dimeric form of guaiacyl propane nucleus in spruce lignin. Besides this, a lignosulphonic acid is formed which is not precipitated by brucine, and which, on hydrolysis reduces Fehling solution strongly. Whether or not sugar is split off in this reaction is not known.

(C) The fact that hydrolysis and solution of polysaccharides acid of lignin in wood, are closely related processes, was indicated by the fact that spruce wood when hydrolized with buffered acid solutions (*p*H 2) yielded far less carbohydrate matter than it did when treated with sulphite liquor of the same acidity.

(D) While red rot *(Polyporus annosus)* lowered the yield of and the strength of sulphite pulp from spruce, there appeared to be a little loss in quality when dissolving (rayon) pulp was made from rotted wood.

(E) Vanillin yields from waste liquor seemed to depend on cooking procedures, and there were instances in which no vanillin was found.

(F) The reducing value of "slops" from sulphite waste liquor when calculated to reducing sugars was higher than the true sugar concentration.

(G) When the lime content of an acid cooking liquor was high, so-called reducing sugar-sulphonic acids were obtained in appreciable amounts, at the maximum temperature of a sulphite cook. Such compounds prolong the fermentation period and lower ethanol yields.

(H) The method of the American Cyanamid Company for the separation of resins and fatty acids from sulphate soaps proved unsatisfactory when applied to Swedish sulphate soaps, unless modifications (prehydrolysis) are used.

(I) Methods were given for the determination of residual lignin in sulphite or rayon pulps. Here samples should be completely extracted since rosin causes discoloration when it contacts sulphuric acid. Residual lignin in pulp is correlated with the manner of digestion. By preventing condensation of the solid lignosulphonic acid in the solid phase, the occurence of residual lignin in bleached pulp may be prevented.

(J) Results of the Committee on Analyses are reviewed. These include the lignin determination, wood gums, alpha, beta, and gama cellulose, alkali solubility, and pulp bleachability. E. Hägglund. Svensk Papperstidn. 45, 123-35 (1942) through Bull. Institute of Paper Chemistry 12, 336 (1942).

Cornstalk Hemicelluloses

Cornstalks, previously freed from fats, waxes, sugars, and pectic materials, were extracted exhaustively with 5 per cent aqueous sodium hydroxide at room temperature. The extract was precipitated by the addition of alcohol, and the resulting precipitate was delignified by chlorination followed by extraction with alcoholic ethanolamine. The residual hemicellulose was then hydrolyzed with dilute sulphuric acid and yielded a molar ratio of two d-glucuronic acids to seven l-arabinose to nineteen d-xylose residues. The material remaining after the 5 per cent NaOH extraction was then extracted with 10 per cent and 17 per cent NaOH, and two other hemicellulose fractions were obtained in this way. Both of these gave xylose and arabinose on hydrolysis but they differed quantitatively from the initial hemicellulose fraction. H. D. Weithe and Max Phillips. J. Ag. Research 64, No. 7, 401-6 (1942).

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Inquiries should be addressed to James Atkins, Munsey Building, Washington, D. C.

Waterproof and Greaseproof Paper

Patent No. 2,276,244. Harry C. Fisher and James F. Thompson, Cincinnati, and Walter E. Sooy, Middletown, Ohio, assignors to The Gardner-Richardson Company, Middletown, Ohio, a corporation of Ohio. Original application October 7, 1937, Serial No. 167,758. Divided and this application November 22, 1939, Serial No. 305,584. 9 Claims. (Cl. 91—68). A method of forming a substantially waterproof and greaseproof sheet of paper which comprises applying to the surface of a sheet of paper a lower surface coating layer including a water soluble adhesive from the group consisting of glue, casein, soy bean flour, and proteins derived from soy bean flour, and a plasticizing agent therefor adapted to maintain said coating in a flexible condition, applying a hardening agent comprising formaldehyde to said lower coating layer, thereafter forming a smooth uniform film consisting essentially of a solution of resinous material in an organic solvent of a character adapted to wet the surface of the lower coating, and transferring such preformed smooth surface film of resinous material onto said coated sheet of paper in homogeneously bonded and adhering relation thereto to provide a coated sheet having the upper coating layer uniformly and homogeneously distributed over and keyed into said lower coating layer so as to be jointly flexible therewith.

Apparatus for Controlling Paper Manufacture

Patent No. 2,272,970. Webster W. Frymoyer, Foxboro, Mass., assignor to The Foxboro Company, Foxboro, Mass., a corporation of Massachusetts. Application September 4, 1937, Serial No. 162,406. 4 Claims. (Cl. 137—78). A device for measuring the dry weight of material in a suspension flowing from a delivery opening of a flow box, comprising, in combination, a flow box having a weir dividing said box into an overflow chamber and a delivery chamber, said delivery chamber having a delivery orifice and a sampling orifice located at right angles to the direction of flow in said delivery chamber, a measuring chamber receiving flow from said sampling orifice and having a discharge tube near its base capable of influencing flow through said tube to vary the head in said measuring chamber in accordance with the viscosity of the suspension flowing therethrough, and a measuring device responsive to the head in said measuring chamber.

A device for controlling the dry weight of pulp in a stuff of varying consistency flowing from a flow box, comprising, in combination, a flow box having a weir dividing said box into an overflow chamber and a delivery chamber, means for supplying stuff to said flow box, means for adding diluting water to said stuff, a sampling orifice in said delivery chamber, a measuring chamber receiving flow from said sampling orifice and having a discharge tube near its base capable of influencing flow through said tube to vary the head in said measuring chamber in accordance with the viscosity of stuff flowing therethrough, means responsive to the head in said measuring chamber for regulating said diluting water means, and a delivery orifice located in said delivery chamber and at such a distance below said sampling orifice as to compensate for variations in the dry weight of pulp flowing through said delivery orifice due to the departure of the effective viscosity-consistency relationship of said stuff from strict proportionality.

Manufacture of Dry-Gummed Flexible Sheet Material

Patent No. 2,275,059. Trevor R. Gautier, Nashua, N. H., assignor to Nashua Gummed and Coated Paper Company, Nashua, N. H., a corporation of Massachusetts. Application November 25, 1938, Serial No. 242,171. 1 Claim. (Cl. 91—67.9). In the manufacture of dry-gum-coated paper and like flexible web and strip material subsequently to be rendered adhesive for use, the process which comprises conducting from a supply a base web of such material, applying gum coating to at least one face of the web, further advancing the coated web prior to dry-hardening of its gum coating, providing gum-embossing formations of selected area and contour and moving them adjacently to a coated face of the web in the direction of the web advance and at substantially the same linear speed, establishing and maintaining a wetted condition for the embossing formations to avoid adherence of gum thereto, tensioning the advancing web in a manner biasing its adjacent coated face toward the embossing formations and thereby effecting pressing contact of the latter with the gum coating while it is in semi-fluid condition so as to form corresponding embossed areas solely in and but partially through the coating, and continuing the advancing travel of the web and drying its gum coating while prominently retaining said embossed areas in it for adhesive efficiency improving and marking purposes.

Drier Felt for Paper Machines

Patent No. 2,260,940. Edward H. Hall, Fitchburg, Mass. Application April 27, 1939, Serial No. 270,367. 1 Claim. (Cl. 139—412). A unitary woven fabric drier felt for paper making machines having a closely woven face and a relatively openly woven back and consisting, in combination, of three superposed horizontally extending layers of weft threads arranged in substantially vertically alined groups and warp threads divided into a first, a second, a third, and a fourth set, the threads of said first set being woven over and under given successive weft threads of both the top and the intermediate layers, the threads of said second set being woven under and over said given successive weft threads of both the top and intermediate layers, the threads of said third set being woven over and under given successive weft threads of both the intermediate and bottom layers, and the threads of the fourth set being woven under and over said given successive weft threads of both the intermediate and bottom layers, the threads of the first and second sets being closely disposed weftwise of the fabric substantially to conceal the weft threads and to form a uniformly continuous and relatively smooth face, the threads of the third and fourth sets being equal in number to no more than substantially one-half the number of threads in the first and second sets and being arranged in pairs of closely disposed threads, the said pairs being substantially uniformly spaced weftwise to expose at the back of the fabric substantially no less in the aggregate than half the entire length of each weft thread of the lower layer and also to expose at the back of the fabric portions of some of the face warp threads, whereby there is provided a direct thread path or moisture from the exposed face of the felt to the exposed back of the felt.

Paper Machine

Patent No. 2,276,877. Oscar Rolls, Honefoss, Norway. Application January 21, 1937, Serial No. 121,502. In Norway January 17, 1936. 8 Claims. (Cl. 92—44). In a paper-machine of the Fourdrinier type, the combination of a breast-roll, a wire-cloth running over said breast-roll, a pulp outlet for supplying pulp to said wire-cloth above said breast-roll, and a vacuum box located below said pulp outlet in front of the upward moving portion of said breast-roll, a portion of the surface of said breast-roll forming a wall of said vacuum box.

Segmental Abrasive Wheel for Pulp Grinding

Patent No. 2,279,486. Leon A. Patt, Sanborn, N. Y., assignor to The Carborundum Company, Niagara Falls, N. Y., a corporation of Delaware. Application December 14, 1939, Serial No. 309,217. 7 Claims. (Cl. 51—207). A segmental wheel having a rim comprised of a plurality of abrasive segments, a concrete center supporting the segmental rim and having a substantially larger coefficient of thermal expansion than the abrasive segments, a plurality of anchor hooks each having a curved end that is heated in an opening in the side of an abrasive segment and having the opposite end adapted for a coupling connection, a plurality of inwardly extending rods each of which has an outer end that is adapted to be attached to said coupling connection and an inner end partially embedded in the concrete center, the anchor hooks having approximately the same coefficient of thermal expansion as the abrasive segments, and the inwardly extending rods having approximately the same coefficient of thermal expansion as the concrete center.

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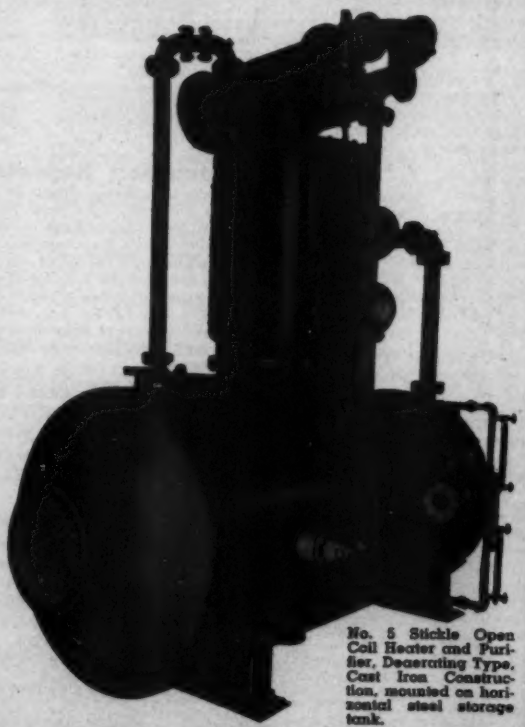
1. Bring feed water into direct contact with steam, permitting instantaneous transmission of heat from steam to water, delivering feed water to pump at temperature within two degrees of temperature of saturated steam in heater.

2. Add all steam condensed in heating feed water to boiler feed supply, automatically making a large portion of total boiler supply absolutely free of scale-forming substances.

3. Perform indefinitely without repairs. Trays easily removed through door for cleaning. Water does not overflow sides of trays and scale-forming matter does not accumulate on side walls of heaters.



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New Catalogues and Association Reports

Blackmer Pump Co., Grand Rapids, Mich.—Bulletin 301, "Facts about Rotary Pumps," gives a very clear explanation of the operating principle of swinging vane type rotary pumps. The operation of the "buckets" (swinging vanes), and pictures of them are given.

S. F. Bowser & Co., Inc., Fort Wayne, Ind.—A new "Industrial Equipment Catalog" has just been published by this company. The 40 pages contain information on equipment designed to meet liquid handling problems. The equipment is indexed under the following heads: Filtration and Distillation, Lubrication Equipment, Metering Equipment, Pumping Equipment, Refueling Systems, Storage and Dispensing, and Miscellaneous Equipment, and it is described in detail and illustrated.

Bristol Co., Waterbury, Conn.—This company has just issued a new bulletin No. T302, on its line of fully-compensated liquid-filled recording thermometers for temperatures between −125 Fahr. and 400 Fahr. The bulletin contains detailed information concerning construction of the instrument, the various forms in which it is furnished, and information concerning its application.

Emby Products Co., Los Angeles, Cal. —A bulletin recently released by this company contains technical data and electrical characteristics of the blocking layer photoelectric cells. Among the topics covered are the diagrammatic assembly, current output, voltage characteristic, influence of temperature, fatigue, internal resistance, operating temperature, and time lag. All necessary information for applications of photo cells of this type in different branches of industry is given.

Foxboro Co., Foxboro, Mass.—The new bulletin A-264, "Liquid Density Recorder," describes and illustrates instruments for the automatic measurement and recording of densities of process liquids. Both the density recorder, which records the continuous, direct measurement of the flowing liquid, and the stabilog density controller, for processes where automatic control of density is important, are included in the bulletin. Copies sent on request.

Goulds Pumps, Inc., Seneca Falls, N. Y.—As a special wartime service to pump operators, this company's "Pump Application Sheets" have been made available. They include both elementary and advanced technical data on selection, installation, operation, and maintenance of all types of industrial pumps for general and specialized services. The sheets, with an 18-page booklet, "Pump Fundamentals," are furnished in a durable file folder containing an extra pocket for personal notes and hydraulic data. Address requests to the company, Department 51.

D. W. Haering & Co., Inc., Chicago—This company's new 6-page pamphlet entitled "Cook County School of Nursing Solves Condensate Corrosion Problem" contains case history data on condensate corrosion control by the Haering process of direct introduction of chemicals into the steam. It is illustrated with pictures of piping before and after steam conditioning, as well as charts recording the analytical results and changes during the test period. Copies available.

Johns-Manville, New York City—A new operating practice manual, just published, gives many practical suggestions on getting better service from maintenance materials. Called "101 Suggestions for Good Operating Practice," the guide outlines in tabular form hints on lengthening the life of packings, insulations, roofings, friction materials, and refractory products. Copies of the book, Form PP-9A, sent upon request.

Lincoln Electric Co., Cleveland, Ohio—An arc welding inspection chart has just been published by this company. It presents very graphically the different types of welds obtained when the work is done normally, with normal current, voltage and speed, as compared with those obtained when these factors are not normal. The chart also illustrates the use of the "Fleet-Fillet" technique of welding, developed by the Lincoln Electric Company. Copies available.

New Jersey Zinc Co., New York City —This company has just released a folder containing information about the wartime status of zinc. The facts are presented in a very condensed form, and are profusely illustrated. Among the subjects discussed are zinc in paint, in metal spraying, in optical glass, and its use in war production, both in metal and pigment form.

Pennsylvania Salt Mfg. Co., Philadelphia, Pa.—L. L. Hedgepeth, manager of technical service for this company, is the author of a study entitled "Warfare Chemical Hazards," which is a reprint of an informal lecture given by him before air raid wardens in Delaware County, Pa. Gas warfare from the standpoint of civilian defense protective measures is discussed, and Mr. Hedgepeth names the principal war gases, their characteristics, effects, and suggests first aid treatment for victims. A limited supply of reprints is available.

Republic Steel Corp., Cleveland, Ohio —The metallurgists of this company have prepared a list of suggestions on how to prolong the life of equipment made of Enduro stainless steels. These suggestions have been printed on easy-to-read wall cards for posting in convenient places in the plant. Six separate wall cards have been prepared for specific types of equipment, including (1) Food and Beverage Processing Equipment, (2) Food Handling and Service Equipment, (3) Dairy Equipment, (4) Pulp and Paper Equipment, (5) Process and Chemical Equipment, (6) Textile Equipment.

Roller-Smith Co., Bethlehem, Pa.—Direct current and alternating current indicating instruments for mounting on switchboards are described in the new 12-page catalogue No. 4230. Dimensions, weights, and list prices on all instruments are included. Copies may be obtained from the company.

Roots-Connersville Blower Corp., Connersville, Ind.—Bulletin 22:23-B-11, just issued by Roots-Connersville, covers rotary positive blowers. This 20-page bulletin is very well illustrated, showing numerous installation views, details of construction, etc. Typical accessories are also shown and discussed in detail. Copies may be had from this company.

Superintendent of Documents, Washington, D. C.—A 72-page booklet entitled "OEM Handbook" was recently issued, describing in detail the organization of the War Production Board, the Office of Price Administration, and the functions and organization of the other war agencies with the Office of Emergency Management. In most cases, personnel is listed down to the branch level in each agency. Included are organization charts of the WPB and the Bureau of Industry Branches of the WPB Division of Industry Operations, as well as a chart showing the relationship of the various Federal war agencies. Copies are available in room 1501, New Social Security Building, Washington, D. C., the above address, or OEM field offices.

Trabon Engineering Corp., Cleveland, Ohio—The Trabon single pipe centralized system that lubricates all the connected bearings without employing any springs, diaphragms, packing or exposed moving parts is described in a new 4-page folder, complete with engineering diagram. This Bulletin 423 is entitled "Trabon Reversing Lubricating System."

U. S. Stoneware Co., Akron, Ohio—"Universal Centrifugal Acid Pumps" is the title of this company's new bulletin No. 702. It describes and pictures in a condensed form the new and improved Series 697 chemical stoneware lined centrifugal acid pumps for all corrosive solutions, hot or cold. Specifications and characteristic performance curves are also included.

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.—A modern sectional motor drive for paper machines is described in a new 12-page booklet announced by this company. Important features of this sectional drive are enumerated, and operating advantages listed. Schematic diagrams of the system and a typical drive circuit are shown. A copy of the booklet, B-3045, may be secured from department 7-N-20 of this company.

Wheelco Instruments Co., Chicago—Bulletin Z6000 is a condensed listing of this company's complete line of measuring and control instruments. It describes and illustrates unit construction of temperature controllers, and explains the company's "electronic principle" for effecting control without contact between the measuring and control functions of the instrument.

Association Reports

All of the orders which affect the industry emanate from the OPA and WPB and clear through the office of E. W. Tinker, executive secretary of the American Paper and Pulp Association. Copies of all government orders are sent by the Association to members. Listed below are releases sent out during June by the APPA. Any correspondence with that office regarding these releases should carry identifying numbers under "National Defense."

Legislation and Public Affairs No. 130 —Informative Bulletins Nos. 10 and 11. Transportation.

Legislation and Public Affairs No. 132 —Amendment 3 to Maximum Price Regulation 129.

Legislation and Public Affairs No. 136 —New Demurrage Rules.

Legislation and Public Affairs No. 137 —Transportation. General Permits and Amendments to General Orders O.D.T. Nos. 3, 4, 5, and 6.

Legislation and Public Affairs No. 144 —Informative Bulletin No. 13. Proceedings of Meeting of Chlorine Subcommittee.

Legislation and Public Affairs No. 146 —Transportation—Amended Demurrage Rules.

Legislation and Public Affairs No. 147 —Wastepaper—Amendment No. 5 to Revised Price Schedule No. 30.

Legislation and Public Affairs No. 149 —Informative Bulletin No. 14. Proceedings of Meeting of the Pulp and Paper Industry Advisory Committee.

The Sorg Paper Co., Middletown, Ohio, uses this 37-foot Kalamazoo Glazed Tile Chest adapted for the Shartle Bros. "Agi-Flow".

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TILE CHESTS

Low storage cost, smooth walls inside and out for quick cleaning, and carefully designed adaptation to pump delivery and agitation for stock storage and bleaching—those are the advantages that make Kalamazoo Glazed Tile Chests a good business investment.

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KALAMAZOO, MICHIGAN

WOOD

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EFFICIENT—Powered rotary chipping provides positive removal of foreign matter. Adjustable depth shoe prevents excessive chipping or damage to under surface.

ECONOMICAL—Replaces sand blasting and other expensive, tedious methods. No special skill required to use . . . cutter heads renewable . . . motor cannot become overloaded.

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Green Chromium Oxides
Black, Brown, Red, Yellow Iron Oxides
Lamp Black—Umbers—Venetian Reds—Yellow Ochres

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Easton, Pennsylvania

CURRENT MARKET QUOTATIONS

RAGS (Domestic)
f.o.b. New York City

NEW RAGS

	per cwt.
Blue Overalls	5.50 to 5.75
Corduroy	2.75 to 3.00
Cottons—	
Washables, No. 1	3.00 to 3.25
Fancy Percales	4.40 to 4.60
New Soft Blacks	3.75 to 4.00
New Light Seconds	2.75 to 3.00
New Dark Seconds	2.50 to 2.75
Khaki Cuttings—	
Mixed	3.50 to 3.75
O. D.	4.00 to 4.25
New White Canvas	6.50 to 6.75
New Mixed Blacks	3.00 to 3.25
Shirt Cuttings—	
New White No. 1	7.00 to 7.25
Silesias No. 1	5.25 to 5.50
New Unbleached	7.25 to 7.50
Fancy	3.50 to 3.75
Linen Cuttings—	
White	14.00 to 14.50
Grey	13.50 to 14.00

RAGS (Domestic)
f. o. b. New York City

OLD RAGS

OPA ceiling prices in sales to consuming mills f. o. b. cars at points of shipment, with brokers' allowances of $1 to $2 a ton depending on the value of the grade involved.

	per ton
Roofing—	
No. 1	31.00
No. 2	29.00
No. 3 and No. 4	27.00
Twos and Blues—	
Repacked	44.00
Thirds and Blues—	
Repacked	44.00
Miscellaneous	36.00
Whites, No. 1—	
Repacked	76.00
Miscellaneous	64.00
Whites, No. 2—	
Repacked	58.00
Miscellaneous	53.00

RAGS (Foreign)
ex dock New York City

NEW RAGS — per cwt. — Nominal

New Dark Cuttings
New Mixed Cuttings
New Light Silesias
Light Flannelettes
Unbleached Cuttings
New White Cuttings
New Light Oxfords
New Light Prints

RAGS (Foreign)
ex dock New York City

OLD RAGS — per cwt. — Nominal

No. 1 White Linens
No. 2 White Linens
No. 3 White Linens
No. 4 White Linens
No. 1 White Cottons
No. 2 White Cottons
No. 3 White Cottons
No. 4 White Cottons
Extra Light Prints
Ord. Light Prints
Med. Light Prints
Dutch Blue Cottons
French Blue Cottons
French Blue Linens
Checks and Blues
Linsey Garments
Dark Cottons
Old Shapperies

ROPE and BAGGING
f. o. b. and ex dock New York City

	per cwt.
Gunny No. 1—	
Foreign	Nominal
Domestic	4.75 to 5.00
Wool Tares—	
Light	4.50 to 4.75
Heavy	4.75 to 5.00
No. 1 Scrap Bagging	4.00 to 4.25
Manila Rope—	
Foreign	—
Domestic	*115.00-
New Burlap Cuttings	5.75 to 6.00
Jute Threads—	
Foreign (Nom.)	6.25 to 6.75
Domestic	5.50 to 6.00
Strings—	
Sisal	3.75 to 4.00
Soft Jute	4.75 to 5.00
Mixed	1.25 to 1.50

*OPA ceiling price per ton f. o. b. shipping point.

WASTE PAPER

OPA ceiling prices in sales to consuming mills f. o. b. points of shipment East of Rocky Mountains; additional $1 a ton loaded on freight cars and brokers' commissions of 4 to 9 per cent allowed.

	per ton
Shavings—	
White Env. Cuts, One-Cut	67.50-
Hard White Env. Cuts	62.50-
Hard White, Unruled	57.50-
Hard White, Ruled	50.00-
Soft White, One-Cut	57.50-
Soft White, Misc.	43.00-
Fly Leaf, No. 1	53.50-
Fly Leaf, No. 2	22.50-
Fly Leaf, Woody, No. 1	25.00-
No. 2 Mixed Col. Woody	18.00-
Mixed Colored	15.00-
Flat Stock—	
Overissue Magazines	53.50-
No. 1 Heavy Magazines	31.50-
Mixed Books	20.50-
Ledger Stock—	
No. 1 White	43.50-
No. 1 Mixed (Colored)	37.50-
Manilas—	
New Env. Cuttings	53.00-
New Env. Cuts, One-Cut	57.50-
Extra Manilas	37.00-
Manila Tab Cards, Free of Ground Wood	45.00-
Colored Manila Tab Cards, Free of Ground Wood	30.00-
Ground Wood Manila Tab Cards	27.00-
Ground Wood Manila Tab Cards, Colored	20.00-
Kraft—	
Envelope Cuttings	65.00-
Mixed Env. or Bag Cuts	55.00-
Tripled Sorted No. 1 Brown	50.00-
New 100% Cor. Cuts	45.00-
No. 1 Old Assorted	35.00-
News—	
White Blank	33.00-
Overissue	17.00-
No. 1 Baled	15.00-
Old Corrugated Boxes	20.00-
New Corrugated Cuts	21.50-
Box Board Chips	14.50-
No. 1 Mixed Paper	14.00-

CHEMICALS
f. o. b. shipping point

Alum (Papermakers)—	
Lump, cwt.	4.25-
Ground, cwt.	4.00-
Powdered, cwt.	4.40-
Blanc Fixe—	
Pulp, bulk, ton	40.00 to 46.50
Dry, barrels, pound	60.00 to -
Bleaching Powder—	
Drums, cwt.	2.25 to 3.10
Casein (Domestic Standard)—	
20-30 mesh (bags), lb.	18.00 to 18.50
80-100 mesh (bags), lb.	19.00 to 19.50
Argentine, lb.	—
China Clay—	
Domestic Filler Bulk (mine) ton	7.50 to 15.00
Domestic Coating Bulk (mine) ton	12.00 to 22.00
Imported (ship side) Bulk (lump) ton	15.00 to 26.00
Chlorine—	
Tank cars (wks) cwt.	2.00 to 2.25
Gelatine (silicin), lb.	.90 to .95
Glyc. (C.P.) drums, lb.	18.25 to 18.75
Litharge, powd., bbl., lb.	.09 to -
Rosin (Gum)—	
New York, per 100 lbs.	
E	3.75-
F	3.80-
G	3.80-
WW	4.05-
Rosin (Wood), carlots	3.12-
Salt Cake—	
Dom. bulk (wks) ton	15.00 to 16.00
Imp. bulks on dock— (Atl. ports) ton (Nom.)	30.00 to
Soda Ash—	
Bulk (works), cwt.	.90 to .95
Paper Bags, cwt.	1.05 to 1.35
Barrels, cwt.	1.05 to 1.35
Soda (Caustic)—	
Solid, drums, cwt.	2.30 -
Ground and flake, drums, cwt.	2.70 -
Sodium Silicate—	
60 deg., 55 gal. drums, (works) cwt.	1.65 to 2.05
40 deg., 35 gal. drums, (works) cwt.	.80 to 1.45
Starch—	
Pearl, 140 lb. bags, cwt.	3.10-
Pearl, barrels, cwt.	3.20-
Paper (Sp.) bags, cwt.	3.20-
barrels, cwt.	3.30-
Sulphur (crude)—	
(mine) bulk, long ton	16.00 to 20.50
Talc—	
Dom. 100 lb. bags (mine) ton	15.00 to 21.00
Imp., bulk, ton (Nom.)	—
Titanium Dioxide—	
Barium Pig., bbls., lb.	.05¼ to .06
Calcium Pig., bbls., lb.	.05 to .05¼
Zinc Sulphide, bbls., lb.	.06¼ to .08½

WOOD PULP

OPA maximum prices applicable to wood pulp delivered to consumer mills located East of the Continental Divide exclusive of Denver, Colo.:

Bleached softwood sulphite	$76.00
Unbleached softwood sulphite	66.00
Bleached hardwood sulphite	73.50
Unbleached hardwood sulphite	63.50
Bleached Mitscherlich sulphite	81.00
Unbleached Mitscherlich sulphite	72.00
Northern bleached sulphate	86.00
Southern bleached sulphate	79.00
Northern semi-bleached sulphate	82.00
Southern semi-bleached sulphate	75.00
Standard news print siderurus	46.00
Northern unbleached sulphate	73.00
Southern unbleached sulphate	63.50
Bleached soda pulp	66.00
Unbleached soda pulp	62.00
Ground wood pulp	46.00
Sulphite screenings	38.50
Sulphate screenings	28.00
Ground wood screenings	30.00
Northern unbleached sulphate siderurus	73.00
Southern unbleached sulphate siderurus	63.50

PAPER
f. o. b. New York City

	per ton
Boards—	
Binders	84.00-
Chip	45.00-
Chip, agl. mla. lined	60.00-
Coated, white patent .016	80.00-
.020 and heavier	75.00-
Kraft liner	60.00-
News	48.00-
Book (cased)	per cwt.
No. 1 Coated	15.50-
No. 2 Coated	14.00-
No. 3 Coated	13.25-
No. 4 Coated	12.75-
No. 2 Offset	11.00-
A Grade Super	10.75-
B Grade Super	10.25-
Bonds (Rag Content)—	
100% Rag	per cwt.
Ext. No. 1	42.00 to 46.00
100% Rag	35.00 to 37.75
85% Rag	
75% Rag	26.90 to 29.00
65% Rag	
50% Rag	20.80 to 23.75
25% Rag	18.20 to 20.00
Regular Colors	1.00 cwt. extra
Bonds (Sulphite)—	per cwt.
No. 1	11.70-
No. 2	10.75-
No. 4	9.90-
Colors	1.00 cwt. extra
Glassine (f. o. b. mill)—	per cwt.
Embossed (25 lb. up)	13.75 to 14.25
Bleached (25 lb. up)	12.75 to 13.25
Unbleach. (25 lb. up)	11.50 to 12.00
Greaseproof—	
Bleach. (25 lb. up)	11.00 to 11.50
Unbleach. (25 lb. up)	10.00 to 10.50
Ledgers (Rag Content)—	
100% Rag	per cwt.
Ext. No. 1	41.40 to 48.50
100% Rag	36.25 to 39.25
85% Rag	32.20 to 37.75
75% Rag	28.15 to 30.50
65% Rag	22.80 to 27.75
50% Rag	22.10 to 24.25
25% Rag	19.50 to 21.50
Regular Colors	1.00 cwt. extra
Ledgers (Sulphite)—	per cwt.
No. 1	13.00-
No. 2	12.05-
No. 4	11.20-
News—	per ton
Rolls (Contract)	50.00-
Rolls (Spot)	(nominal)
Sheets	58.00-
Tissues (Carlots)—	per ream
White, No. 1	1.12½
White, No. 2	1.00-
Bleached Anti-Tarnish	1.15-
Colored	—
Anti-Tarnish Kraft	.70-
Manila	.90 to .95
Napkins, semi-crepe (12½ lb. to M shts.) per ea.	.60-
Napkins, full crepe and emb'sed (12½ lb. to M shts.) per ea.	.60-
Toilet, Bleached (M shts.) per ea.	5.65-
Toilet, Unbleached (M shts.) per ea.	4.25-
Towels—	per case
Bleached	3.20 to 3.75
Unbleached	2.60 to 3.05
Wrappings (Kraft)—	per cwt.
Extra Quality	6.00 to 7.00
Super-Standard	5.25 to 6.00
No. 1 Wrapping	5.00 -
Standard Bag	4.37½
Wrappings (Sulphite and Bleached Kraft)— (Rolls, f. o. b. mill)	
Bleached papers—	per cwt.
M.F. & M.G. Waxing, 20 lb. (Carloads only)	7.25 to 7.50
(10,000 lbs.)	7.50 to 7.75
Drug wrapp. 35 lb.	7.00 to 7.25
Unbleached Papers—	
Com. Grd. Butch. 40 lb.	5.50 to 5.75
No. 1 Butchers	5.75 to 6.00
No. 1 Imit. Parch & Dry Fin. Groc. Sulphite 30 lb.	6.25 to 6.50
No. 2 Imit. Parch & Dry Fin. Groc. Sulphite 30 lb.	6.00 to 6.25
Steam Finish, 50 lb.	5.00 to 5.25
Water Finish, 40 lb.	5.50 to 5.75
Manilas—	
Envp. Mla., Sub. 16-40 (No. 1)	6.00 to 6.25
Envp. Mla., Sub. 16-28 (No. 2)	5.75 to 6.00
Envp. Mla. (Prices based on large sheets untrim'd ream-marked, in bdls.)	
Wrapp. Mla. 35 lb. up—	
No. 1	6.00 to 6.25
No. 2	5.75 to 6.00
M. G. Sulphite and Kraft (other than Waxing)	
Grade A-22 lb.	7.20 to 7.40
Grade B-20 lb.	6.75 to 7.00

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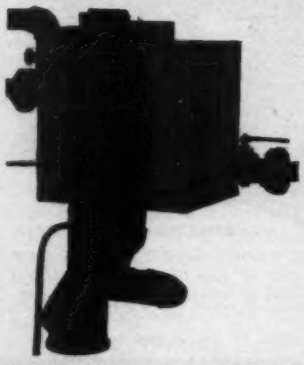
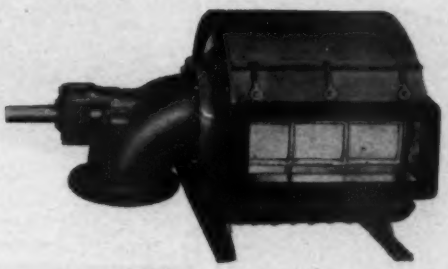


Trimbey Consistency Regulator Pump Type



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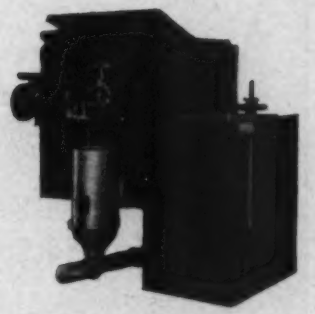

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Acme Steel Company.....
American Chain & Cable Co. 433
American Cyanamid & Chemical Corporation 353
American Manganese Steel Co. 423
Appleton Machine Co., The..... 385
Appleton Wire Works, Inc. .....
Appleton Woolen Mills..... 439
Armstrong Machine Works..... 416
Asten-Hill Mfg. Co. .....
Atkins and Company, E. C. 445
Audit Bureau of Circulations..... 354
Aurand Mfg. & Equipment Co. 453
Bagley & Sewall Co. .....
Baker-Raulang Co., The..... 335
Bauer Bros. Co., The..... 431
Barrell Company, William L. .....
Beloit Iron Works..... 329
Betz, W. H. & L. D. 377
Binney & Smith Co. 451
Bird Machine Company.....
Black-Clawson Co., The..... 407
Boston Woven Hose & Rubber Co. 389
Bowser & Co., Inc., S. F. 439
Bowsher Co., The N. P. 447
Brown Instrument Co., The.....
Buell Engineering Co., Inc. 334
Buffalo Pumps, Inc. 330
Bulkley, Dunton Pulp Co., Inc. .....
Calco Chemical Division..... 349
Cambridge Instrument Co., Inc. 418
Cameron Machine Co. 443
Carthage Machine Co. .....
Cash Company, A. W. 355
Central Machine Works..... 438
Chain Belt Company..... 401
Chemipulp Process, Inc. 338-339
Chicago Bridge & Iron Company.....
Chromium Corp. of America..... 403
Classified Advertising 439
Cleveland Tramrail Div., The Cleveland Crane & Engineering Co. 379
Columbia Chemical Division.....
Columbian Carbon Co. 451
Corn Products Sales Co. 456
Corning Glass Works.....441
Covel-Hanchett Company..... 348
Darnell Corporation, Ltd. .....
De Laval Steam Turbine Co. 397
Diamond Alkali Company..... 383
Diamond Iron Works, Inc. 440
Dilts Machine Works..... 407
Downingtown Mfg. Co. .....1st Cover
Draper Brothers Company..... 421
du Pont de Nemours & Co., E. I. .....
Duriron Co., Inc., The..... 361
Eastwood-Nealley Corporation..... 442
English China Clays Sales Corp. 420
Fairbanks Company, The.....
Ferguson & Co., Hardy S. 445
Fitchburg Screen Plate Co., Inc. .....
Flexible Steel Lacing Co. .....
Foxboro Company, The..... 360
Francis Company, Chas. E. .....
Frederick Iron & Steel Co. 456
Fritz Publications, Inc. 433, 458
Garlock Packing Co., The.....
Gates Rubber Company..... 375
General Coal Co. .....
General Electric Co. 381
Goulds Pumps, Inc. 443
Graton & Knight Company..... 364
Graver Tank & Mfg. Co., Inc. 447
Greene, Tweed & Company..... 426
Grinnell Co., Inc., The.....
Hardy, George F. 440
Harrington & King Perforating Co. 445
Harris-Seybold-Potter Co. .....
Heller & Merz Department..... 349
Hewitt Machine Co., J. W. 439
Hills-McCanna Co. .....
Houghton & Co., E. F. 337
Hunt Machine Co., Rodney..... 446
Huyck & Sons, F. C. .....
Improved Paper Mach'y Corp. 429
International Nickel Co., Inc. .....
International Wire Works..... 438
Jessop Steel Company.....
Jewell Belt Hook Company..... 439
Johnson Corporation, The..... 437
Johnstone Engrg. & Machine Co. 453
Jones & Sons Company, E. D. 439
Jones Foundry & Machine Co., W. A. 455
Kalamazoo Tank & Silo Co. 453
Kalamazoo Vegetable Parchment Co... 449
Koppers Company 393-394
Langston Co., Samuel M. .....3rd Cover
Lawrence Machine & Pump Corp. ....
Layne & Bowler, Inc. 434
Lewellen Manufacturing Co. 441
Lindsay Wire Weaving Co., The..... 409
Link-Belt Company 359
Lockport Felt Co. 449
Lunkenheimer Co., The..... 413
Magnus Chemical Company..... 424
Mason-Neilan Regulator Co. .....
Mathieson Alkali Works, Inc. 332
Mercury Manufacturing Company....
Michigan Steel Casting Co. 435
Mixing Equipment Co., Inc. .....
Monsanto Chemical Company..... 399
Morey Paper Mill Supply Co. .....
Morris Machine Works..... 419
Mt. Vernon-Woodberry Mills, Inc. 387
Murray Mfg. Co., D. J. 437
Nash Engineering Co., The..... 437
National Oil Products Co. .....
National Safety Council, Inc. 427
Naylor Pipe Company..... 429
Nichols Engrg. & Research Corp. ....
Norma-Hoffmann Bearings Corp. 425
Norton Company 382
Norwood Engineering Co., The..... 431
Oakite Products, Inc. 433
Ohio Injector Co., The.....
Oliver United Filters, Inc. .....
Orr Felt & Blanket Co., The.....
Paper & Industrial Appliances, Inc. ....
Paper Makers Chemical Dept. of Hercules Powder Company..... 415
Patterson Foundry & Mach. Co. .....
Perkins & Son, Inc., B. F. .....4th Cover
Philadelphia Quartz Co. 422
Pittsburgh Piping & Equipment Co. ... 383
Pittsburgh Plate Glass Co. .....
Poole Foundry & Machine Co. 445
Powell Company, The Wm. 347
Pulp Bleaching Company..... 439
Pusey & Jones Corp., The..... 343
Reading Chain & Block Corp. 436
Reliance Electric & Engrg. Co. .....
Research Corporation 336
Rockwood Manufacturing Co. ...2nd Cover
Rogers & Co., Samuel C. 427
Rollway Bearing Co., Inc. .....
Roots-Connersville Blower Corp. .....
Ross Engineering Corp., J. O. .....
Ryerson & Son, Inc., Joseph T. 427
Sandusky Foundry & Machine Co. 435
Shartle Bros. Machine Co. 407
Shuler & Benninghoven..... 411
Simonds Saw and Steel Co. 458
Simonds Worden White Co. 447
Sinclair Company, The.....
Smith & Winchester Mfg. Co. 435
Solvay Sales Corporation.....
Stanley Works, The.....
Stebbins Engrg. & Mfg. Co. 428
Stickle Steam Specialties Co. 451
Sutherland Refiner Corporation..... 435
Texas Company, The..... 331
Timken Roller Bearing Co., The..... 356
Titanium Pigment Corporation..... 405
Towmotor Company .....
Treasury Dept., U. S. A. 417
Trimbey Machine Works..... 455
Turner Halsey Company..... 387
United Carbon Company.....
United Service Organizations.....
United States Rubber Company..... 345
Vanderbilt Co., Inc., R. T. .....
Valley Iron Works Company..... 351
Waldron Corporation, John..... 440
Warren Steam Pump Co., Inc. 400
Waterbury & Sons Co., H. 447
Waterbury Felt Co., The..... 442
Weyerhaeuser Timber Co. .....
Williams and Co., C. K. 453
Wood's Sons Co., T. B. .....
Worthington Pump & Machinery Corp. 391
Wright Manufacturing Div. of American Chain & Cable Co. 433

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